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Overview of Flow

The Washington State Department of Transportation Traffic Systems Management Center (TSMC) flow operation has three main components:

1. Surveillance, control and driver information (SC&DI) devices;
2. Personnel;
3. Information obtained by other agencies and networks.

All these components are dedicated to increasing safety and minimizing delays on Seattle area freeways.

Surveillance, Control and Driver Information (SC&DI)

SC&DI equipment is made up of closed circuit television cameras (CCTVs), electronic data stations (ESs), loop detectors, highway advisory radio transmitters (HARTs), highway advisory radio signs (HARSs), and variable message signs (VMSs).

- **CCTVs:** Cameras in the field that monitor the flow of traffic and help confirm the incidents reported by other sources. They run on a fiberoptic cable system. There are approximately 280 CCTVs located along the major freeways.
- **ESs:** A metal cabinet in the field, enclosing a model “170 controller” that gathers data from a set of loop detectors and controls ramp meters, where applicable, at a single highway location. The ES collects data from the loop detectors and relays it to a hub. The hub gathers information from many cabinets and directs it to TSMC, where the VAX mainframe computer controls all the hubs. Selected information from the VAX is sent to the flow Operator by way of the Traffic Management System software (TMS98). This information is in the form of flow maps and other windows in TMS98.
- **Loop detectors:** Wire loops embedded in the roadway that detect vehicles via inductance. When a large piece of metal, namely a vehicle, passes above the loop, the magnetic field is disturbed and the loop registers a “hit,” or gets data. This data is sent to the ES.
- **HARTs:** Transmitters that send out radio transmissions of traffic-related information at an AM frequency of either 530 kHz or 1610 kHz. Drivers can tune their radios to hear traffic or construction information. Messages are recorded on HARTs by flow operators and radio operators.

Overview of Flow

(continued)

- **HARSs:** Yellow signs with black lettering which tell drivers to tune to 530 AM or 1610 AM for traffic, construction, or highway pass information. Many HARSs have two beacons that flash when a message is being broadcast on the corresponding HART, prompting motorists to tune to the HAR message. Others are static signs that always direct motorists to tune to 530 or 1610 for traffic advisory. Presently, HARSs with beacons must be activated independently from the transmitters (HARTs). Many HARSs are located just prior to a decision point, such as a freeway interchange. As with HARTs, HARSs are also operated by TSMC and Radio personnel.
- **VMSs:** Highway signs that display traffic-related information. Like HARSs, VMSs are usually located just prior to a decision point, such as a freeway interchange. Messages can be created to fit each particular traffic-related circumstance. VMSs are operated by TSMC and Radio personnel. Messages are displayed with pixels (dots or flip disks). Backlights can be used to make the sign more visible, particularly at night. Flashing beacons can be used to give the message more emphasis.
- **Ramp Meters:** Traffic signals placed on freeway on-ramps. When in operation ramp meters will alternate between the red and green lights, restricting the number of vehicles entering the freeway, thereby reducing congestion and bottlenecks on the mainline. Ramp meters are controlled by TSMC personnel.

SC&DI Equipment Inventory (As of July 30, 2002)

Closed Circuit Television Cameras: 279
Electronic Stations (measure occupancies, speeds, and volumes): 331
Highway Advisory Radio Transmitters (HART): 10
Highway Advisory Radio Signs (HARS): 24
Loop Detectors: 4524
Variable Message Signs: 54
Ramp Meters: 191

Personnel

Many different people help make the flow system work:

- **Flow Operators** interpret information to produce traffic reports, regulate ramp metering, use VMSs and HARS to inform motorists about traffic conditions, inform the media about roadway incidents, and help keep the system hardware working.

Overview of Flow

(continued)

- **Radio Operators** serve as the communications link between WSP, maintenance personnel, incident response teams, tunnel operators, and project inspectors. They manage emergency situations on a regular basis. They also use VMSs and HARs during non-flow hours, monitor the Convention Center for fires and other potential emergencies, and update the mountain pass reports during the winter months.
- **Tunnel Operators** work to ensure the safety of motorists traveling through the Mount Baker Tunnel and Mercer Island Lid on Interstate 90. They monitor the ventilation and fire suppression systems and use SC&DI devices to monitor and manage traffic through the tunnels.
- **Incident Response Teams** provide traffic control and roadway clearing services for highway incidents; easing the burden on the WSP and helping to minimize the impact of delays.
- **Maintenance Technicians** troubleshoot and repair equipment, keeping the system at full capability.

Information Obtained by Other Agencies and Networks

In addition to the SC&DI tools available, TSMC also has access to information from several other agencies:

- A direct network link with the Washington State Patrol's (WSP) Computer-Aided Dispatch (CAD) system (most incident detection begins here).
- Direct phone line to Metro Networks, accessing traffic information from: 1) their airborne units, 2) their bird's eye view from the Bank of America building, and 3) their communications with WSP, which are more frequent than ours.

Rules to Follow in the Flow/Control Room

Since the Flow Control Room is the most popular place for tours in the Northwest Region Headquarters by WSDOT personnel, legislators, and private citizens, it is important to keep in mind the following guidelines with respect to public image.

- Keep all equipment in its place. This equipment includes mice, mouse pads, keyboards and their cords, pens, note pads, and the various flow manuals. Keeping the work area clean is of utmost importance in this very public work place.
- No personal belongings (such as purses, homework, magazines, textbooks, decorations, or other non-flow related objects) are allowed on the control console or anywhere visible from the outside glass window. There is a storage closet to store all personal belongings while on duty.
- No food or drinks near the control console or anywhere visible from the outside glass windows.
- Personal phone calls at work are not recommended (except for emergency situations), as they decrease the efficiency and effectiveness of the flow operation, especially during peak periods.
- While you are on duty, you are allowed visits from friends, but only during breaks. Visits from friends should not interfere with work responsibilities. Studying with friends is not allowed during your shift, including weekend shifts.
- Internet usage is for official WSDOT business only. This can include finding information about traffic conditions (passes, ferries, etc.) and checking to ensure that information on the WSDOT web site is current and accurate.

Responsibilities of Flow Operators

One of our primary missions at the Traffic Systems Management Center (TSMC) is to provide the most current, accurate, and useful traffic information for the public (both directly and through the media). In doing this, a Flow Operator must remain flexible while establishing strategies appropriate to each work situation. In devising strategies, the Flow Operator should always consider the major responsibilities of the job.

Monitor Current Traffic Conditions

- Continuously refer to the input devices (WSP CAD, scanner, CCTVs, TMS98 maps, and radio transmissions), to track incidents and form a cohesive picture of traffic conditions.

Report Traffic to the General Public and Media

During peak periods, it is your duty as a Flow Operator to prioritize. Following is a list of the approximate order of priority that tasks should be given. If you ever have a specific question about priorities, call one of the Flow Engineers and they will advise you.

1. First priority is always given to preserving life and administering emergency assistance when needed. Blocking incidents or injury accidents not already reported on CAD or the scanner should be called in to WSP. Put up VMSs and/or HARSs to divert traffic away from areas of danger and delay.
2. The Flow Operator on duty is responsible for making traffic updates on WSDOT's Commuter Information Line (DOT-HIWY or 368-4499, ALSO 1-800-695-ROAD). The public and media may access this phone number to receive up-to-date traffic information. Traffic reports should be made at least once every 10 minutes during peak traffic, and should always be updated as conditions change.
3. Deliver text messages (Incident Reports) to WSDOT's remote users (media and general public) through the Traffic Management System (TMS98) software as soon as conditions change.
4. Answer telephone inquiries by the media regarding specific incidents, maintaining our professional yet friendly rapport.
5. Efficiently use appropriate Driver Information devices such as Variable Message Signs (VMSs) and Highway Advisory Radio (HAR) to advise motorists of incident-related or construction-related traffic conditions.

Responsibilities of Flow Operators

(continued)

Control Ramp Meters to Maximize Freeway Efficiency

- Activate and deactivate ramp meters at selected freeway on-ramps, based on time of day and need. Adjust fuzzymeter parameters to minimize delay and optimize efficiency on both the ramps and freeway (more on this in the Ramp Metering section). Ramp meters often require special attention when there is a blocking incident nearby that disrupts the merge, so when dealing with incidents, don't forget to pay attention to nearby ramp meters.

Assist in System Upkeep

- Check all SC&DI devices for proper operation (data stations and loops, ramp meters, VMSs, HARTs, HARSs, CCTVs, computers, etc.). There is a daily checklist that assists you in going through and checking the equipment.
- Report device failures to a Flow Engineer.
- Ensure the WSDOT's Commuter Information Line is delivering the most accurate and up-to-date information (traffic report and other construction information). Listen to every category of traffic-related information and report any stale messages to the agency that made the recording.
- Ensure WSDOT's WinFlow32 software server is regularly updating the traffic map and incident reports. Inform a Flow Engineer if this system is not updating.
- Verify that the Internet camera and map images and the incident report page is updating. Inform a Flow Engineer if this system is not updating.
- Help maintain a clean and orderly state in the Flow Control Room.

Getting Started

The Flow Operators who come in for the first shift in the morning are responsible for the following tasks:

- Turn on PCs and PC monitors. Log into TMS98. Under **Messages**, send an **Incident Report** that states that the TSMC is now open.
- Access the Washington State Patrol Computer Aided Dispatch (CAD) Log.
- Turn on the rear-projection monitor (big screen monitor), and turn on the scanner.
- Check with Radio Operators to see if any major incidents recently occurred.
- Review the Driver Information Package (DIP) for VMS and/or HART operation and compare VMSs, HARTs, and HARs to ensure correct communication of information. Update the HAR online file.
- Check the monthly calendar for Major Events. Include a message on your Incident Report and record a message in Slot #13 on the Echodyne.
- Begin traffic reports on the DOT-HIWY line.
- Verify that all cameras are pointing at appropriate views of the roadway, not zoomed in too closely or pointing only at ramps.

For explanation of these tasks, see the specific section in this handbook.

Other tasks

The daily tasks are listed on the "Flow Operator's Checklist" in "The Checklist Collection" binder on the flow console. Each shift Flow Operators are required to check every item on the checklist. It is very important that you verify each completed item/task by initialing your name in the boxes provided. Please note that by signing your initials, you help provide an information pathway for engineers or maintenance people in documenting problems. If you did not perform part of the duties on the checklist, ask your replacement to complete it. Do not initial the task until it is performed. AM and PM checklists are required to be completed daily with no exceptions.

Besides regular flow duties, the weekend Flow Operators are also responsible for the weekend housekeeping tasks.

Getting Started

(continued)

Logging on to TMS98

1. Double-click on the TMS98 icon on the desktop.
2. At the TMS98 – Logon, enter your User ID and Password, then press **Logon**.
3. After your successful login, a window should appear called **Maps – TMS98**.

If you experience problems with logging in, contact one of the Flow Engineers for assistance.


The default map that appears in the Maps – TMS98 window is “System.map.”





The following is a partial list of the maps available for the operators to choose from. There are additional maps, and maps are occasionally added to the system:

<u><i>File</i></u>	<u><i>Description</i></u>
Ramp metering.map	The ramp metering flow map
testrack.map	ESs that do not appear on maps
System.map	The main flow map

On the maps are links that allow you to quickly go to another map.

To Ramp Meters  This takes you to a map that matches the ramp metering icons with the cameras that allows you to see the ramp meters (a useful learning tool for ramp metering).

ZOOM  This will take you to a map that shows more detail for a particular area (for instance, to allow you to see the I-5/I-90 interchange more clearly).

To main map  This will take you back to the main flow map.

Washington State Patrol CAD Log

Background

The Washington State Patrol (WSP) Computer-Aided Dispatch (CAD) log is one of the many sources the TSMC uses for incident detection and verification. It displays all incidents on the state highways that the WSP is aware of from traffic-related to unlawful activities on the state routes or properties. It is your responsibility to extract **only** traffic-related incidents to be included in the traffic report.

The following is a list of some abbreviations that the WSP uses.

<i>Abbreviation</i>	<i>Interpretation</i>
1C, 2C, 5C	Number of cars involved
ABD	Abandoned vehicle
ACC	Accident (note: this term has been dropped in favor of Collision)
AIR	Air patrol
BLK	Blocking the roadway
CD	Collector distributor
COL	Collision
DAV	Disabled vehicle (stalled vehicle)
DUP	Duplicate CAD entry
ERD	Erratically driven vehicle
F, FAT	Fatalities involved (NEVER report as a fatality)
FIR	Fire
HAZ	Hazardous material spill
GP	Gore point
I/C	Interchange
INJ	Injury
JE, JW, JN, JS	Just east, just west, just north, just south
L1, L2, L3	Lane number, counting with the right lane as L1
MED	Medical emergency
ML	Mainline
PAT	Patrolling
PD	Property damage involved (no injuries)
PDH	Property damage hit-and-run accident (no injuries)
PIH	Personal injury hit-and-run accident
PED	Pedestrian
P1, P2, P5	Incident occurred in the past 1, 2, 5 minutes
PI	Personal injuries involved
PU, PK	Pick-up truck
RL, LL, CL	Right lane, left lane, center lane
RS, LS	Right shoulder, left shoulder
STL	Stolen vehicle
TRF	Traffic hazard
TSP	Traffic stop
VAT	Abandoned vehicle – tow requested (vehicle usually left on a ferry)
>, <, or -	Roadway has been cleared to right or left
*	Additional information in CAD “inquiry page” (press F5)

Washington State Patrol's CAD Log

(continued)

Logon to WSP's CAD

1. Open **EXTRA!** by clicking on the desktop icon. To use these accounts, make sure you are using "session1.edp"
2. The WSDOT screen will appear. At the Userid prompt, type the flow user ID.
3. The cursor will automatically drop to the *Password* prompt. Type in the password and then press **ENTER**. (The password always changes on the first day of the month.) The current password should be written on the information board next to the hot seat.
4. Press the **F8** key (until you see the listing for CICSCAD). CICSCAD is always the last entry.
5. Press the **down-arrow** key to move the cursor to the CICSCAD and press "**ENTER**".
6. At the Userid prompt, type the TSMC user ID.
7. **TAB** to go to the *Password* prompt, type in password of the month (same as in step 4), and press **ENTER**.
8. Press the **F1** key to go to the *Active Report Log* menu.
9. Press the **F7** key to go to the *Browsing* menu.

Logon to WSP's CAD using "backup"

1. Open **EXTRA!** by clicking on the desktop icon. To use this account, make sure you are using "backup.edp"
2. The WSDOT screen will appear. At the Userid prompt, type the TSMC user ID.
3. **TAB** to go to the *Password* prompt, type in password of the month (same as in step 4), and press **ENTER**. (The password always changes on the first day of the month.) The current password should be written on the information board next to the hot seat.
4. Press the **F1** key to go to the Computer Aided Dispatch CICS Main Menu

Washington State Patrol's CAD Log (continued)

5. Press the **F1** key to go to the *Active Report Log* menu.
6. Press the **F7** key to go to the *Browsing* menu.

There are occasions when you might be asked to retrieve information about previous incidents (i.e. someone needs the CAD Log for a major incident). To do this, go to the main menu, and press the **F2** key to go to the *Current History Menu*. This menu is similar to the *Active Report Log Menu*, so don't get these two confused. To find an incident, you can either do a parameter search (Press **F2**) or browse incidents (Press **F7**). Parameter search is the easiest, but sometimes you won't be able to find an incident that you know exists using search. To browse incidents, type in the year, month, and day. This is followed by the four digit incident number and then the two digit zone. For instance, incident 1536 in zone 02 on February 20, 2078 would be: 780220153602. Browsing incidents is time-consuming since it lists all incidents for a day in all zones, but sometimes it is the only way that works.

The following is a list of codes for all of the WSP dispatch areas. You should be checking zones 02 and 07 for blocking incidents.

- | | |
|-----------|--|
| 01 | = Tacoma / Olympia (Pierce and Thurston counties) |
| 02 | = Bellevue / Seattle (King County) |
| 03 | = Yakima area |
| 04 | = Spokane area |
| 05 | = Vancouver, WA area |
| 06 | = Wenatchee |
| 07 | = Everett (Snohomish, Skagit, and Whatcom counties) |
| 08 | = Bremerton and Olympic Peninsula |

For CAD-related help or information, contact one of the Flow Engineers

Driver Information Package

The Driver Information Package (DIP) is prepared by one of the Flow Engineers. It describes how various SC&DI devices (such as HARTs, HARs, and VMSs) will be used to publicize upcoming events that will affect traffic. These events include closures due to construction and maintenance work, and flammable materials restrictions.

The DIP will be distributed to all TSMC staff, including Flow Operators and radio operators. It should be kept on file in the "Checklist Collection" binder. It is your responsibility to make sure that specific messages will be displayed on assigned VMSs or activated on assigned HARs at the specified date and time in the DIP. You must check the DIP at the beginning of your shift, and write any deviations on it.

At the beginning of the shift, you must:

1. Check that the VMSs, HARTs, and HARs are executing their assigned messages and functions.
2. Visually confirm the VMSs and HARs where possible, and listen to the recordings on the HARTs for clarity and grammar.
3. Check the HAR Status Excel file to ensure that appropriate HAR equipment is in use.

Note: If specified in the DIP, the beginning or ending of activities must be verified before implementing the assigned task through Radio or by CCTV.

Controlling Cameras

Background

Currently, there are more than 250 Closed Circuit Televisions (CCTVs) in operation at the TSMC. They are placed along major highways and are used for monitoring and verifying traffic situations. The majority of these CCTVs are color cameras with 16:1 zoom lenses and pan, tilt, zoom, and focus capabilities; the range of the cameras is approximately 2500 feet. All of the cameras have a field of view of 20° and a horizontal pan range of 355° in one direction (there is a pan stop installed to prevent the control and communication cables from getting twisted around the pole). When you can't turn the camera anymore in one direction, stop panning in that direction to prevent the pan/tilt motor from burning up. You will have to turn the camera all the way around in the opposite direction. As a general rule, all cameras should always be zoomed out to provide the broadest view possible of the freeway section. Avoid aiming the camera at direct sunlight or bright light sources because the iris will be weakened.

Camera Usage Standards

You should not be able to recognize make and model of vehicles (and certainly not the license plate), and you should not be able to make out the identities of individuals. Whenever there are injuries involved, make sure that the cameras do not in any way show the injured people – turn the camera away if necessary to avoid shots of the injured. Only zoom in to verify the details of an incident, and only keep the camera zoomed in enough to be aware of changes to the scene (i.e. when lanes are blocked or reopened). WSP also has control of the cameras, and if you feel they are zoomed in too close, take control of the camera and zoom it out.

Keep in mind that KOMO (4), KING (5), KIRO (7), KCPQ (13), and Metro Transit have viewing access to our CCTVs. The monitor on the far right shows what the four television stations are currently looking at; if you see them looking at a camera that is zoomed in too close, make sure to correct that. Close shots of an incident/accident ***must*** not be shown to the public.

Types of CCTV Communications

Currently, the video for all CCTVs is transmitted through fiber optic cables. Control is transmitted through either twisted pair coaxial cable or fiber optic cable

Joystick Priority

Overall, the Flow and Radio Operators have the priority in obtaining the control of CCTVs. Priority in obtaining control of CCTVs varies according to rank. The priority rank is as follows:

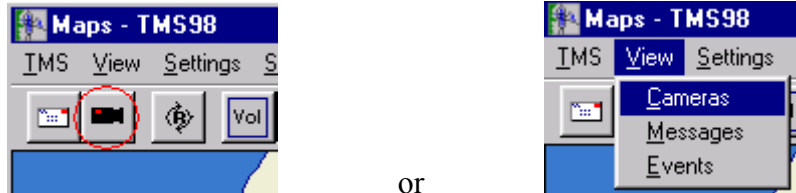
1. Manager (MGR)
2. Supervisor (SUPV)
3. Operator (OPER)
4. Trainee (TRNE)
5. Tour (TOUR)

Anyone may gain control of the camera from another user regardless of rank of priority if the controls have been idle for more than 20 seconds.

Controlling Cameras (continued)

Accessing the Camera Control – TMS98 Window

To access CCTV cameras, click on the Camera button on the **Maps – TMS98** window or select **Cameras** from the **View** pull-down menu.



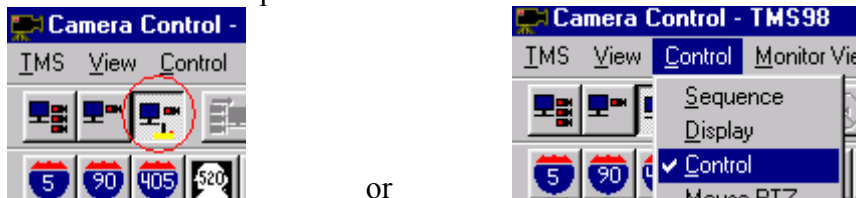
OR

This will bring up the **Camera Control – TMS98** window:



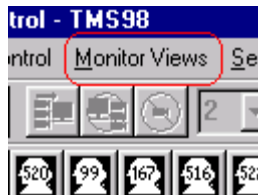
Control

1. To obtain control of a camera, click the **Control** button on the menu bar or select **Control** from the **Control** pull-down menu.

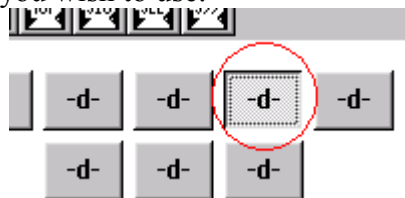


OR

2. Select the **Monitor Views** pull-down menu, and then select the desired set of views (Usually, this will be TSMC Left, TSMC Center, or TSMC Right, depending on which flow console you are using).



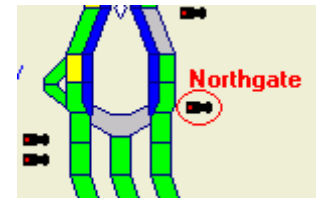
3. Click on the monitor that you wish to use.



Controlling Cameras (continued)

- Now that you have a monitor selected, click on a camera on the list to display that camera on a monitor or click on a camera icon on the map.

	CCTV074	I-5 @ Duwamish River	156.53
	CCTV075	I-5 @ MLK Jr Way	157.28
	CCTV077	I-5 @ Boeing Access Rd	157.92
	CCTV080	I-5 @ S Boeing Field	158.88
	CCTV081	I-5 @ Mid Boeing Field	159.68
	CCTV082	I-5 @ S Duwamish River	160.00

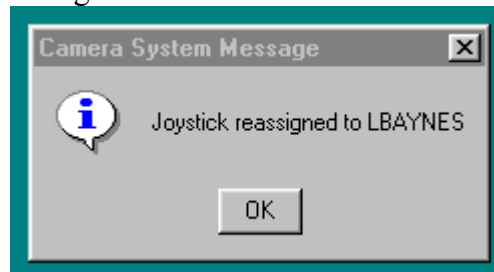


or

- Use the joystick to search for your target.

Regaining Control of CCTVs when Control is Re-assigned to Another Operator

Anyone may gain control of the camera from another user regardless of rank of priority if the controls have been idle for more than 20 seconds. When control is taken away, a message is sent to the previous user indicating that camera control has been reassigned to another user.



You lose all control of CCTVs until you follow the previous steps to establish control of a camera.

Display

The display feature allows you to view a camera without controlling it. To display a camera, click the **Display** button on the menu bar or select **Display** from the **Control** pull-down menu.



or



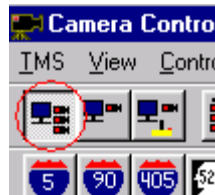
Controlling Cameras (continued)

Sequence

The sequence function enables the user to select a group of cameras to be viewed in a desired order and duration time (or dwell time) on a particular monitor. The sequenced cameras currently assigned to the selected sequence monitor are indicated by index numbers following each camera name. These numbers show the order of a sequence. Any number of up to 255 cameras may be selected in a sequence.

When you want to create a (new) sequence on a monitor, follow the procedures described below to create a sequence.

1. From the camera list, select the first camera for your sequence
2. Click the **Sequence** button on the menu bar or select **Sequence** from the **Control** pull-down menu



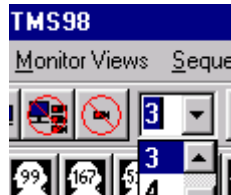
or



3. After you select **Sequence**, the first camera will automatically be entered into the sequence as shown below. "Sequence" shows the order of the cameras, and "Dwell" shows the dwell time in seconds.

Cabinet	Location	Milepost	Sequence	Dwell
CCTV508	SR-520 @ West Highrise	2.37	1	3
CCTV509	SR-520 @ Midspan	2.41		

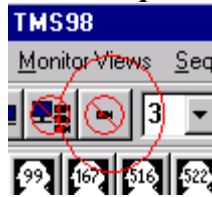
4. To change the dwell time for a camera, click on the pulldown button shown below, or type in the dwell time in seconds (up to 99 sec). Double click on the camera in the camera list to implement the new dwell time.



5. To add additional cameras to the sequence, double click on them in the camera list. Each camera can have its own dwell time if you want.

Controlling Cameras (continued)

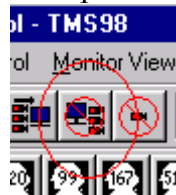
6. To delete a camera from a sequence, click on the **Delete Camera** button or select **Delete Camera** from the **Sequence** pull-down menu.



or



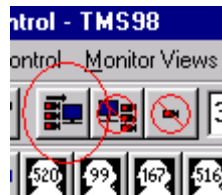
7. If you wish to clear an entire sequence, click on the **Clear all** button or select **Clear all** from the **Sequence** pull-down menu.



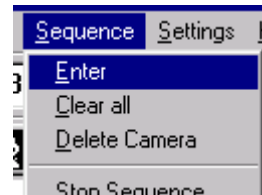
or



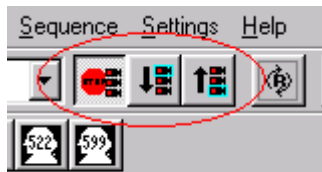
8. To enter a completed sequence, click on the **Enter sequence** button or select **Enter** from the **Sequence** pull-down menu. The sequence will now be displayed on your monitor.



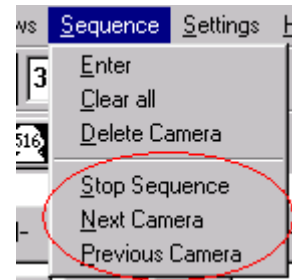
or



9. To stop the sequence or manually cycle the sequence, use Stop Sequence, Next Camera, and Previous Camera.



or



10. You can save your sequence by right clicking on the monitor displaying your sequence,



which looks like this: This will bring up a window that allows you to name your sequence. The VAX will store your sequence, and you can display it simply by right clicking on a monitor and selecting the saved sequence from the list that appears.

Controlling Cameras

(continued)

Panning/Tilting the Camera

The camera has the capability to pan right and left, tilt up and down. To pan and tilt the camera, tilt the joystick to the desired direction.

In order to properly pan/tilt the cameras, position the base of the joystick control so that the black cord is away from you.

<u>Camera Movement</u>	<u>Direction of Joystick Handle</u>
UP	AWAY FROM YOU
DOWN	TOWARDS YOU
LEFT	TO YOUR LEFT
RIGHT	TO YOUR RIGHT

Zooming the Camera

Press the top button down while moving the joystick *up* or *down* to zoom in or out.

Focusing the Camera Picture

Press the top button down while moving the joystick *left* or *right* to adjust the focus.

Resetting the Joystick

Sometimes the joystick won't move in one direction for some reason or other. To reset the joystick, make sure it is completely centered, and simultaneously press the two square gray buttons. This should recalibrate the joystick.

Making/Updating Traffic Report

Because our traffic reports are one of the most direct contacts we have with the public, our reporting quality and style shape the public's image of the WSDOT. You must show the highest degree of professionalism when making the traffic report. There should be no inappropriate language or sounds (such as sighing, laughing, swearing, or joking) in the traffic report.

It is important to understand that one of the primary functions of the TSMC is to provide motorists the most up-to-date traffic information, since this allows drivers to avoid congested areas.

- During peak traffic hours (6:00 to 9:00 AM and 2:30 to 7:00 PM), you must make traffic reports at least once every 10 minutes, and definitely each time conditions change significantly.
- During off-peak traffic hours, traffic updates should be made as needed. (If there is no heavy traffic to report, it's okay to say, *"Currently there are no blocking incidents or areas of heavy congestion to report. This report will be updated as conditions change."* or something similar, without stating the time.

Flow Operators are responsible for making traffic reports on the DOT-HIWAY line (368-4499) during flow hours (5:30 AM to 7:30 PM weekdays and 9:00 to 6:00 PM weekends).

The information given out to the public must be **traffic-related only**. For instance, if there is an injury accident at a certain location, the most we are allowed to inform the public is:

- Whether this specific accident is blocking the roadway,
- If the roadway is blocked, how many lanes are blocked and which ones?
- How many vehicles are involved?
- How long is the blockage expected to last? or How far is the backup?
- Is WSP, fire, ambulance, tow at the scene?
- If motorists should be advised to use alternate routes. (Due to liability issues, DO NOT mention any specific route).

Never report fatalities or the status of injured individuals in the traffic report or to the public. It is critical that we not violate anyone's privacy in doing our job. Also, while you should report a vehicle fire on the incident page, do not refer to it as a fire on any VMS, HART, or in the traffic report – it is OK to refer to it as an accident. We don't want to give motorists any information that might encourage them to travel to the scene of the accident.

Making/Updating Traffic Report

(continued)

The WSDOT Highway Information Line [DOT-HIWY (368-4499) or 1-800 695-ROAD (695-7623)]

The DOT-HIWY line is a public service phone line that provides the public with traffic-related information. The public may dial this number and select from one of the following categories to receive detailed information. The list of categories includes:

- Current Seattle Area Traffic Report (includes express lane status report)
- Current Tacoma Area Incident Report
- Mountain Pass Reports
- Construction/Road Conditions of state highways, county roads, and city streets
- Washington State Ferries schedule changes
- Transit & Carpool information

Note that you are responsible for updating the current traffic report and the express lane status report; as well as checking that the other reports are up-to-date. The Tacoma Area Incident Report and Olympic Region Construction Report are recorded by Tacoma Radio. The Mountain Pass Report is recorded by Seattle Radio. The Construction Traffic Coordination Office (CTCO) is responsible for recording construction/road conditions for major state highways. The Seattle Engineering Department, the Bellevue Engineering Department, and the King County Engineering Department are responsible for corresponding road information. The Washington State Ferries is responsible for recording the ferries information. Metro Transit is responsible for recording transit information.

Background of the DOT-HIWY Recording Software

The Echodyne 240 Menu Program Configurator (MPC) is the software program that sets up the voice recording program used to record all of the traffic-related information for the DOT-HIWY line. This program is set up so that there will be menu messages to give callers various options to choose and receive specific traffic-related information.

The complete layout of the entire Echodyne (lists of messages, message slot numbers, and the corresponding time limits) can be found in Appendix A.

Making/Updating Traffic Report

(continued)

Standard Format of Traffic Report for DOT-HIWAY

The Flow Operator is responsible for updating the traffic report. The traffic report consists of four parts:

- Slot 11: Greeting (good morning, afternoon, or evening, and date)
- Slot 12: Current Traffic Report
- Slot 13: Auxiliary Traffic Conditions - For incidents or closures that will last a substantial period of time (This slot is usually left blank).
- Slot 15: Express Lane Status Report

Greeting

The greeting should be in the following format:

"Good morning(afternoon/evening). Today is Wednesday, February 20."

Current Traffic Report

As a standard TSMC guideline, traffic updates should be reported in the following format:

1. Time – *This traffic report is for 8:30 AM*
2. Accidents, blocking problems, emergency roadway/lane closures.
3. NB I-5
4. SB I-5
5. I-5 Express Lanes
6. EB SR 520
7. WB SR 520
8. EB I-90
9. WB I-90
10. I-90 Express Lanes
11. NB I-405
12. SB I-405
13. NB SR 167
14. SB SR 167

Making/Updating Traffic Report

(continued)

This is only a guideline, and can be deviated from; for example, if there is little traffic congestion, only the involved areas need be reported then the following format is acceptable:

- *I-5 Northbound has [traffic condition and location],*
- *I-5 southbound has [traffic condition and location].*
- *I-405 southbound has [traffic condition and location],*
- ***there are no other areas of heavy congestion to report at this time.***

Remember to mention the blocking incident/accident again when reporting the traffic condition on the pertinent roadway.

Make an update if an incident is cleared or as soon as conditions change.

When using information from CAD, confirm it by using CCTV, or calling Metro Networks if possible. If you cannot confirm an incident and are not confident that it exists, you may choose to report it, stating something like, "*...and there is a reported accident on I-405 southbound at the S-curves.*"

Express Lanes Status Report

At the beginning of the day and whenever the status of the express lanes changes, a status report is needed. The report should be in the following format:

"The I-5 Express Lanes are [open southbound], [closed], [open northbound], and the I-90 Express Lanes are [open westbound], [closed], [open eastbound]."

Making/Updating Traffic Report

(continued)

Standard Procedure for Accessing DOT-HIWY Recorder

Here are the touch-tone commands for recording and reviewing your traffic reports on the DOT-HIWY line:

Command	Function
1 + [slot A] + *	Play message in slot A (listen only)
3 + [slot A] + *	Record in message slot A
4 + [slot A] + * + [slot B] + *	Swap the content of message slot A with the content of message slot B
*	To begin or to terminate a command. (Silence will follow immediately after a command is initiated. A tone will follow immediately after a command is terminated.)

- Dial echodyne and wait for a tone (a speed dial is programmed as "[personal list] + 1"; it automatically enters the passcode).

The traffic report is recorded in message slot 12. Message slot 14 is the swap (practice) slot for message slots 12 and 13 (auxiliary message slot). Message slots 12, 13 and 14 have a recording length of 180 seconds. The recordings in message slots 12 and 13 are what our callers hear. The swapping function should only be performed when two message slots have the same length. This means only slots 12 and 13 should be swapped with practice slot 14. You **must** record directly into slots 11 and 15. Do not attempt to swap these two slots with the practice slot 14, since the slots have different record times.

Slot 11	Slot 12	Slot 13 (usually empty)	Slot 14 (not heard by callers)	Slot 15
Greeting	Traffic Report	Auxilliary Message	Swap Slot	Express Lanes Status

Ensuring that the DOT-HIWY Line is Accurate and Appropriate

Once during the AM shift, the Flow Operator is responsible for listening to the traffic report on the DOT-HIWY line traffic report, King County, City of Seattle, City of Bellevue, WSDOT Ferries, Metro information, carpool information.

Every Flow Operator doing traffic reports is responsible for calling the DOT-HIWY line to verify that the traffic report is accurate. There should only be one voice on a traffic report, so make sure Slots 11, 12, 13, and 15 all have YOUR voice.

Checking the DOT-HIWY line:

- 1) Dial 368-4499 (DOT-HIWY)
- 2) Listen to the commands and check all required slots. Use the DOT-HIWY Message Tree or the list of available message slots and their corresponding messages illustrated in the pages above. When all slots are checked, hang up.
- 3) Notify the appropriate person when a slot needs to be updated or re-recorded.

When You Find Outdated Information

If you find a slot on the DOT-HIWY line that does not have current information, contact one of the Flow Engineers so the slot can be updated.

Controlling Ramp Meters

Ramp Metering

Ramp metering controls the flow of vehicles entering the freeway by allowing them to merge into mainline traffic one at a time, rather than as a platoon of cars. This is accomplished through the use of vehicle detection devices (induction loops), field controllers, ramp meters, a central computer system (VAX), and you, the flow operator extraordinaire.

- Currently, induction loop detectors are the only vehicle detection devices in use; they detect volumes (numbers) of vehicles and also occupancies (percentage of time the detector is activated) in each lane on the mainline and ramps.
- Field controllers collect traffic data from the loops and send this information to the VAX at the TSMC. The VAX receives the data, then calculates.
- The ramp meters utilize both the volume and occupancy data from detector loops.
- The central computer (VAX) is capable of adjusting upstream metering rates based on downstream conditions. For example, a metering rate at an upstream location will be decreased if a bottleneck develops downstream. Adjustments are also made when the on-ramp queues are too long. The length of an on-ramp queue is also taken into account when determining metering rates.
- Flow Operators activate the meters when the occupancy reaches metering levels. They are pivotal in monitoring the performance of the detectors, meters, and central computer. When malfunctions occur, operators disable detectors, adjust or turn off meters, and troubleshoot computer problems.

Control Algorithms

There are two currently used algorithms that control the ramp metering rate: fuzzymeter and local.

Fuzzymeter

This is the normal mode of operation for the system.

Controlling Ramp Meters

(continued)

Standby Metering

This is used when communications to the central computer are interrupted or when the central computer is "down". In these cases, each ramp meter will determine a metering rate for its on-ramp according to local traffic conditions or by a time of day table, taking into account the on-ramp queue conditions in standby metering. The ramp meter operates independently, without coordinating with other ramp meter controllers, so adjustments for bottlenecks are not made. Also, the Flow Operator cannot change metering parameters (such as minimum metering rate) when the communications are failed.

Metering Algorithms & Adjustments

The field controller determines the metering rates for each meter by selecting the more restrictive metering rate as determined by three separate algorithms:

- Local Metering Algorithm
- Time of Day Metering Algorithm (During communications failures)

Each algorithm computes the number of vehicles allowed to enter the mainline traffic flow. This metering rate is then further adjusted by

- Queue Adjustment
- Advance Queue Adjustment
- Red Violations
- HOV Bypasses.

In the event that communications are lost between the central computer at TSMC and a field controller, the field controller will continue to operate. It will control the ramp and select a metering rate according to the Local Metering Algorithm or a preset Time of Day Metering Algorithm. *The more restrictive of the two is selected as the current metering rate* (DMR). The figure on page 45 shows how the metering rate is calculated.

Local Metering Algorithm

The Local Metering Algorithm considers the occupancy of the adjacent mainline, it does not consider the characteristics of traffic flow downstream or upstream of the ramp in question. The resulting metering rate is referred to as the local metering rate (LMR), and the units are vehicles per minute (vpm). This algorithm is run by the field controller, which allows it to function independently of the central computer if communications are lost.

Controlling Ramp Meters

(continued)

Time of Day Algorithm

The Time of Day Algorithm is run by field controllers, and is only used when there is a communication breakdown between the central computer and a field controller.

This algorithm consists of preset metering rates, on/off times, and days of operation.

The algorithm checks the current day and time against the preset values to determine if it should be metering or not and if so at what rate. For example, the controller may have a preset turn on time of 6:30 AM with an associated metering rate of 18 vpm and another time and rate of 6:55 AM and 12 vpm, respectively. The controller would then start metering at 6:30 AM and allow 18 vehicles to enter the freeway each minute until 6:55 AM when it would decrease the rate to 12 vehicles per minute.

Controlling Ramp Meters

(continued)

HOV Adjustment

At many ramps, there is a non-metered HOV bypass lane, allowing HOV traffic to bypass the metered queue. The purpose of the HOV Adjustment Algorithm is to compensate for HOVs bypassing the ramp meter by reducing the metering rate accordingly.

This algorithm keeps a record of all HOVs that used the bypass for the past minute. This volume is subtracted from the current metering rate (DMR). The new meter rate is calculated as:

$$\text{Metering Rate} = \text{DMR} - \# \text{ of HOVs}$$

In this manner, ramp volumes are kept under control and merging capacities of the mainline remain at optimal levels.

To find out which algorithm is currently governing a ramp meter's metering rate, simply look at the status (S) in the **GROUP METER STATUS** window. Abbreviations are used to designate the governing algorithm and are summarized as follows:

ABBREVIATION	ALGORITHM
L	Local
B	Bottleneck
LQA	Local Queue Adjusted
BQA	Bottleneck Queue Adjusted
BAO	Bottleneck Advance Override
LAO	Local Advance Override

Controlling Ramp Meters

(continued)

General Ramp Metering Information

The ramp metering system was implemented in September 1981. Currently, the system controls the following number of ramps:

I I-5 southbound – 39
I-5 northbound – 32
I-5 reversibles – 1
SR 520 eastbound – 9
SR 520 westbound – 13
I-90 eastbound – 5
I-90 westbound – 16
I-405 northbound – 23
I-405 southbound – 24
SR 167 northbound – 6
SR 167 southbound – 5

Not all ramps are metered, and this is for various reasons. Some ramps have too much volume to be effectively metered (Mercer to I-5), other ramps wouldn't benefit the mainline significantly, some ramps are add-lanes (NE 145th and Lake City Way to southbound I-5), and some ramps are not metered or have restricted operating windows because of policy decisions and/or agreements with different cities.

The following table shows those ramps that have restricted operating windows:

AM Restrictions

I-405	SR 169 (Maple Valley Hwy) to Northbound	ES-634	Do not meter before noon
I-90	Front Street to Westbound	ES-945	Meter only from 7:20 to 8:00

PM Restrictions

I-90	Westbound meters between Bellevue Way and Front Street	ES-893, ES-900, ES-908, ES-920, ES-935, ES-945	Do not meter after noon
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Controlling Ramp Meters

(continued)

When meters are activated, it is the operator's responsibility to verify that each meter is functioning. Though some locations require more attention than others, all meters should be inspected with the cameras, if possible, at least once during the time in which they are activated. Following is a list of what a functioning ramp meter should look like:

AM Peak

Generally during the morning, the heaviest traffic will be heading towards Seattle, but there are other commute areas (such as I-90 EB, SR 520 EB, SR 167 NB, and I-405) that must also be considered. Metering must never begin prior to 5:30 AM, no matter the situation.

PM Peak

During the PM peak, both directions of I-5, both directions of I-405, eastbound SR-520, and eastbound I-90 traffic must be closely monitored. The operator must weigh local mainline occupancy as well as downstream conditions in deciding if, when and where to meter.

All ramp meters must be deactivated by 8:00 PM

Weekend Peak

Gauging local mainline occupancy and downstream effects, the operator must use engineering judgment to determine when to activate and deactivate ramp meters. Due to the unpredictable nature of some weekend congestion, ramps should be more closely monitored for unusual congestion, and ramp meters should be turned on or off as required. Some ramps near malls such as 196th St SW near Alderwood Mall is a good example.

Controlling Ramp Meters

(continued)

Checking Ramp Meter Status and Activating/Deactivating Meters

1. Click on the **RMP** button in the lower status bar at the bottom of the screen. The *Group Meter Status* window will appear on the screen. The Flow Operator may then control and check the status of the meters.
2. Activating/Deactivating Meters:
 - a. Under the **IDENTIFICATION** column, highlight the desired meters.
 - b. To activate meters, click on the box next to *Activate Sel. Meters*. Within 20 seconds, the **STAT** column should indicate an "L" for local metering and a metering rate should be indicated under the **RATE** column.
 - c. To deactivate meters, click on the box next to *Deactivate Sel. Meters*. Within 20 seconds, the **STAT** column should indicate "OFF" for ramp meter status. If meters are not deactivating as commanded, it may be necessary to implement the police switch to immediately turn them off. See the **Police Switch Guidelines** section below for instructions.
3. The button next to *Deselect All* will indicate how many meters have been selected. (NOTE: Check that the number of meters selected is correct before you activate or deactivate.)

Controlling Ramp Meters

(continued)

Police Switch Guidelines

When an operator has selected to deactivate a certain meter, the following process takes place. First, the metering rate is increased to its **RMAX** value in an attempt to alleviate any queue. The meter will not begin the shut down process until its rate is not governed by the Queue Adjust or Queue Advance algorithms. Once this requirement is met, the meter waits for a 10 second gap on the demand loop, in which it receives no hits. After six seconds, if the 10 second gap has not been sensed, the required gap is reduced by 0.1 second. So for the next six seconds, the meter will wait for a gap of 9.9 seconds before it will shut off. This iterative process will continue automatically until an adequate gap is sensed and the meter can shut off. When the meter finally shuts off, it will remain green for one minute, and then turn completely off.

If an adequate gap is never attained to allow the meter to shut off, it may be necessary to manually shut it off. This need would arise when the mainline is flowing smoothly or the time of day does not permit it to be on. Before the police switch is implemented, the operator must first select to deactivate the meter. Then, the meter's **SINGLE STAT** window must be then be accessed by clicking the **EDIT** button. In the **PARAMETERS** window, near the bottom of the list, each metering location has a **POLICE SWITCH** parameter. Highlight it, enable it using the **METER TUNING** button and select **SAVE SETTINGS**. Immediately, the meter(s) at the corresponding location should go green and remain green. At this point, the **GROUP STAT** window will show the meter's status to be **OFF**. It is imperative that the operator **DISABLE** the police switch immediately. The meter will remain green until the police switch is disabled. At this point, the meter will remain off because it has already received the off command. It is highly advisable to keep track of meters with enabled police switches, and to verify all transactions with the cameras.

Sending Incident Messages

Incident messages are one of the key tools we have for getting incident information out to the media and the public. The incident message provides information that appears on television and radio traffic reports, on web sites, including WSDOT's incident page, the Seattle Times web site, and others.

Sending Messages to the Media and Other TMS98 Users

The Flow Operator is responsible for sending messages to our media Winflow software users (i.e. traffic reporters at radio or TV stations) and the Internet. These messages should contain information of traffic-related incidents gathered from different sources available to us, i.e. the incident may have been observed from CCTV, reported by the Radio Operators, or from the WSP's CAD Log.

Anytime you can visually verify an incident that has a noticeable and enduring traffic impact you should send a text message describing the incident. Also send a message when the incident status changes, for example, a blocking accident becomes a non-blocking incident that is cleared off to the shoulder.

IMPORTANT: Here are a few guidelines to always keep in mind:

- Keep in mind that the TSMC personnel are restricted from sending any non-traffic-related details of an incident(s).
- Never include fatalities or the medical status of injured individuals in the messages.
- Do not report any non-traffic related incidents such as TSP (traffic stop) or ROB (robbery) in the messages.
- In most cases, hit-and-run accidents are "standing by" somewhere, and are not affecting traffic whatsoever, and should not be reported. If there's any doubt, check the inquiry page (move cursor to the incident line and press **F5**).
- We are not responsible for reporting incidents off the state highways and interstate freeways. These are listed on CAD as "NA" in the "HIWAY" column. BUT, every now and then an incident occurs on a busy city street, and it's good to report it, so keep your eyes open.

Sending Messages through VAX

(continued)

Routing the Message

There are times when the TSMC will want to send specific messages to a selected group of our VAX on-line or remote users.

With normal operations, the routing list does not need to be checked, unless some change has occurred, such as:

- This is the first message of the shift.
- The VAX has been restarted.
- TMS98 on the PC has been halted and/or the PC has been rebooted.
- You want to add or delete someone from the address list.

The following procedure explains how the Operator can route a message to the media:

1. When you have created an acceptable message, click on the **ROUTE** button in the *TMS Addressable Message* window. A list of users who are logged-on to the VAX will come up in the *Online Users* box.
2. Select users classified as: MEDIA

You may select the entire group by double clicking on any of the users within the media group. All users in the same group will highlight.

3. Make sure that the **Addressable Message** button is selected.
4. Click on the **ACCEPT** button.

NOTE: It is advisable to frequently check your routing list to ensure the appropriate users are still selected.

Sending Messages through VAX

(continued)

The standard format for creating a message reporting an accident or incident is discussed below. Messages sent from the TSMC to remote map users need to be consistent in format and content. Since it is crucial that the media is provided with accurate, unambiguous, and timely information, the following format has been adopted and effective for use in all text messages. Consistency is a **MUST**.

Standard Message Format

1. General Guidelines

- Arrange messages in the order that they have been received.
- Do not send a message until the incident has been confirmed by CCTV (unless there are four or more incidents to check all at once).
- Mark new incidents and updates with an asterisk.
- When incidents have been cleared, leave them up for at least two minutes.
- Use proper abbreviations.
- Send messages about incidents which are reported on CAD but cannot be located with CCTV (to inform the media).

2. Initial Report

Arrange the initial messages in the following order:

- Roadway (I-5, SR520)
- Direction (SB, WB)
- Location (NE 130TH, JS SHIP CANAL)
- Type of incident (DAV, ACC)
- Lanes involved (PART BLKG HOV, BLKG 2CL)
- Source of information (CAD, CCTV, RADIO, WSP)
- Time (0628, 1450)

For instance: * I-405 NB JN NE 85TH 2C/TK INJ ACC BLKG HOV/L2 CCTV 1645

Sending Messages through VAX

(continued)

3. Making Updates

Make all updates at the beginning of the message and cite the source and time. It is necessary to make an update when any of the following occur:

- *Location is updated:*
SR169 NB JN AQUABARN 3C INJ ACC BLKG RL CAD 1039
becomes:
* UPDATE CAD 1043: SR169 SB JN AQUABARN 3C INJ ACC BLKG RL CAD 1039
- *WSP, aid, or DOT arrives on scene:*
* I-5 SB JS 200TH DAV BLKG CL CAD 1533 -- WSP ON SCENE
- *Lanes are cleared, or additional lanes are blocked (remove old lane references):*
I-90 WB JW SR900 ACC BLKG RL CCTV 0715
becomes:
* UPDATE 0755: I-90 WB JW SR900 ACC BLKG 2RL CCTV 0715 AID -- FIRE ON SCENE
- *When an incident reported by CAD is confirmed with CCTV:*
SR520 EB I-405 DAV BLKG RL CAD 1229
becomes:
* SR520 EB I-405 DAV BLKG RL CCTV 1235
- *When an incident cannot be located:*
* UTL 0807: I-5 NB NGATE DAV BLKG HOV CAD 0803
- *When the incident is cleared:*
* CLEARED CAD 1450: SR18 EB PEASLEY CANYON ACC BLKG RL CAD 1347

Sending Messages through VAX

(continued)

Abbreviations Used in the Messages

You may choose to spell words out entirely in the text message, but if you do decide to abbreviate, please use the following list. (The media was informed of and understands the following abbreviations and their meanings. Please do not make up your own!)

(ALDERWOOD)=near Alderwood	CTY=county	ML=mainline
(SCTR)=near Southcenter	DAV=disabled vehicle	MNTLK=Montlake Blvd
(SEMI)=involving a semi	DAV'S=disabled vehicles	MTLK=Montlake Blvd
(TUKWILA)=near Tukwila	DEB=debris	N=north
.25E=1/4 mile east of	DET=details	NB=northbound
.5E=1/2 mile east of	DOT=WSDOT	NGATE=Northgate
1E=1 mile east of	DUW=Duwamish	PART=partially
.25N=1/4 mile north of	E=east	PC=passenger car
.5N=1/2 mile north of	EB=eastbound	PED=pedestrian
1N=1 mile north of	EGATE=Eastgate	PI=involving injuries
.25S=1/4 mile south of	EHRISE=East Highrise	PKWY=parkway
.5S=1/2 mile south of	EHR=East Highrise	PU=pickup
1S=1 mile south of	EXP=Express	RADIO=WSDOT Radio
.25W=1/4 mile west of	FIR=fire department	RCL=right center lane
.5W=1/2 mile west of	FLD=field	RD=road
1W=1 mile west of	FRWY=freeway	RDWY=roadway
2RL=2 right lanes	GP=gore point	RL=right lane
3RL=3 right lanes	HIRISE=highrise	RS=right shoulder
4RL=4 right lanes	HOV=carpool lane	S=south
2CL=2 center lanes	HWY=highway	SAMM=Sammamish
3CL=3 center lanes	INJ=injury	SB=southbound
4CL=4 center lanes	IRT=Incident Response Team	SCENTER=Southcenter
2LL=2 left lanes	ISL=island	SCNTR=Southcenter
3LL=3 left lanes	JE=just east of	SCRVS=S-curves
4LL=4 left lanes	JN=just north of	SCTR=Southcenter
ACC=accident	JS=just south of	SCURVES=S-curves
BELL=Bellevue	JW=just west of	SEA=Seattle
BLK=blocking	L1=right lane	SNO=Snohomish
BLKD=roadway blocked	L2=lane 2	SR=Hwy
BLKG=blocking	L3=lane 3	TK=truck
BOE=Boeing	L4=lane 4	TSMC=Traffic Systems
BRDG=bridge	L5=lane 5	Management Center
CAD=reported	L6=lane 6	TUNN=tunnel
CCTV=verified with camera	L7=lane 7	UNK=details unknown
CD=collector-distributor	LCL=left center lane	UTL=unable to locate with camera
CL=center lane	LK=lake	UW=Univ of Washington
CNTR=Center	LL=left lane	W/CCTV=with camera
CNTY=county	LNS=lanes	W=west
CO=county	LS=left shoulder	WA=Washington
COL=collision	MAINT=maintenance	WASH=Washington
CONV=Convention	MBT=Mount Baker Tunnel	WB=westbound
CR=crest	MED=medical emergency	WHIRISE=West Highrise
CRK=creek	MC=motorcycle	WHR=West Highrise
CRVS=curves	MH=motorhome	WY=way
CTR=Center	MICH=Michigan St	
	MIL=Mercer Island Lid	

Guidelines for Variable Message Sign Use

Introduction

The Variable Message Sign (VMS) system is part of WSDOT's Traffic Management System and is operated by staff at the TSMC. The primary function of the VMS system is to provide drivers with information on unusual traffic conditions. However, the system may also be used for other traffic-related items on a limited basis.

Responsibility for Operation of VMS System

WSDOT's Traffic Systems Management Center is responsible for creating, scheduling, coordinating, and displaying messages through the VMS system. TSMC individuals and groups that may be individually or jointly responsible for these items include Flow Operators, Flow Engineers, Seattle Radio, and Tunnel Operators. The Freeway Operations Engineer oversees all VMS operations and should be contacted with any questions regarding sign operations.

Traffic Conditions for VMS Usage

The manner in which the VMS system is used will vary depending on the nature of the associated traffic condition. Various categories of traffic conditions are described below, along with specific information on the appropriate use of the VMS system.

Traffic Restrictions

In this context, traffic restrictions refer to the prohibition of vehicles from using a roadway. These restrictions may be planned or unplanned, short or long duration, and specific or general. Requests for traffic restriction messages generally come from WSDOT or local agency maintenance offices.

Bridge Drawspan Openings

- Usually SR 520 Evergreen Pt. or SR 104 Hood Canal openings for boat traffic or weather conditions (See procedure page 80)

Flammable Restrictions

- Enacted when SR 5 Convention Center, SR 90 Mt. Baker Tunnel, or SR 90 Mercer Island Lid fire control systems are inoperative

Weight, Height, Width Restrictions

- Restriction would be initiated by a maintenance office
- VMS use only appropriate in emergency situations (e.g. earthquake damaged bridge), not long term use (e.g. construction-related height restriction)

Incidents

The use of the VMS system for incident information requires close monitoring by TSMC personnel. The use of the system for incident information has the greatest potential for increasing or decreasing WSDOT's VMS credibility. If we are accurate and timely with our VMS usage, we increase our credibility.

Disabled Vehicles and Accidents

- VMS used only when incident is visually confirmed or when requested by IRT or WSP
- Communication with IRT or WSP should be through Seattle Radio
- Messages are to be removed quickly once the incident is no longer blocking

Guidelines for Variable Message Sign Use

(continued)

- Messages describe the general nature of the situation (e.g. Accident At Mercer) and traffic impacts (e.g. Congestion from Northgate to Ship Canal Bridge)
- Do not specify alternate routes
- Messages describing severe incident-related traffic conditions may be continued at the discretion of the operator (e.g. Congestion from Northgate to Ship Canal Bridge Due to Earlier Accident). VMSs should not be used to describe recurrent congestion (i.e. normal day to day backups)

Unusual Road and Driving Conditions

- VMSs should not be used to display weather conditions nor expected driving conditions (e.g. icy roadway under near-freezing temperatures)

Construction and Maintenance Information

The VMS system can be an effective *supplement* to construction traffic control. The system should not be used to make up for a lack of traffic control planning. Rather, the system should be used when construction activities require drivers to perform complex maneuvers, for major impacts, or in cases where traditional signing methods are impractical.

WSDOT

- VMS system may be used to display information on lane, ramp, or road closures; detours; and advanced notice for high impact closures
- Construction-related VMS use should be coordinated with Construction Traffic Coordination Office (CTCO)
- Message information limited to the nature of the construction impact and the effect on drivers
Impacts include: Left Lane Closed; Exit 167 Closed
Driver effects include: Use Caution; Use Alternate Route; Follow Detour (only if signed detour provided); Expect Delays (no specific duration)

Non-WSDOT

- VMS use should be coordinated with CTCO
- Establish a method of maintaining communication with outside agency
- Messages follow same guidelines as above

Guidelines for Variable Message Sign Use

(continued)

VMS System Priorities

- WSDOT's first priority is safety. Related to the VMS system, this priority means that any messages that are directly related to safety are given first priority for display. Two notable examples of this type of message are an emergency tunnel closure and a flammable restriction.
- The second VMS system priority is the display of road or ramp closures, regardless of the reason for the closures (accident, construction, etc.). This information has second highest priority because closures directly impact the route a driver would take.
- The third priority is information on minor traffic impacts. Minor traffic impacts include construction lane closures, blocking incidents, and delay information.
- The last priority for the VMS system is PSAs. These messages do not immediately affect drivers, and therefore are not critical to the efficient operation of the transportation system.

Controlling Variable Message Signs (VMS)

Overview

See the "VMS Location Map" at the end of this chapter (also inside the front cover).

VMS Policy

The VMSs associated with the express lanes and tunnels give priority to their respective missions. When one of these VMSs is needed, the following steps must be taken:

For express lanes - contact a Flow Engineer.

For tunnels - inform respective tunnel operator (MBT 587-5071 / MIL 587-5087).

Make sure to let the replacement Flow Operator or Radio Operator know of any signs on for incidents or special events.

VMS Configurations

Not all VMSs are the same size. There are 7 sizes of VMSs that are used for freeway applications:

- 1 line × 18 letters
- 2 lines × 15 letters
- 2 lines × 17 letters
- 2 lines × 18 letters
- 2 lines × 21 letters
- 2 lines × 22 letters
- 3 lines × 8 letters

In general, VMS letters are typically formed by pixels (dots or flip disks). The letters are arranged in a 5-pixels-wide by 7-pixels-tall module and are typically 18 inches tall for mainline freeway application, which will give a minimum readability distance of 800 feet.

Controlling Variable Message Signs (VMS)

(continued)

Some of the VMSs are *continuous* dot matrix and some are *fixed* font. **Continuous** dot matrix VMSs do not have a fixed letter width. The width of a character is actually the proportional font of the characters. Therefore this type of VMS may give us less or more letter capacity on each line than normal. You must use caution when creating a message on these signs to avoid letters being cut off, especially with 3 x 8 signs, which may only display 7 characters per line.

A **fixed** font VMS simply means that each letter is made up of a 5×7 pixel module with a divider between each module. Each letter displayed on this sign will appear in uniform width constraint and each line will have a known letter capacity (8, 15, 21, or 22 letters).

The VMSs will display one-, two- or three-phased messages. Multiple phases are used because the VMS is not large enough to display an entire message in one phase or to draw attention to the sign. The multi-phase option of the VMSs allows a complete message to be delivered to motorists by splitting the message into two or three parts. One message phase typically lasts between 2 and 3 seconds. A car traveling 60 mph has about 9 seconds to read the message on the VMS (if the motorist starts reading at 800 feet from the VMS), which gives the motorist time to read a two- or three-phased message under ideal conditions.

“Canned” messages have been created to minimize the length of the VMS message lists and to expedite the process of displaying messages that inform motorists of blocking incidents. These messages are shown in the VMS message list box and are designated with an asterisk (*). You should use these messages if possible, altering the message to address the specific incident most appropriately. However, the contents of a “canned” message should always maintain agreement with the message title. For instance, a message entitled, “*STALL 520” should always describe a stalled vehicle (not an accident) on SR520 (not I-5, I-405, etc.). Within the restraints of the title, the Flow Operator is encouraged to provide additional details that would assist the public. “Canned” messages are for the benefit of all operators, so they should never be deleted.

VMS Problems Sheet

Occasionally, a VMS will malfunction or require maintenance work. Until the problems are fixed, Flow Operators must strive to create messages that work around these problems. A visual **VMS PROBLEMS SHEET** is maintained and provided to Flow Operators to inform them of existing problems. This sheet should always be referenced before a message is displayed, especially during hours of darkness when VMS backlights are critical.

Controlling Variable Message Signs (VMS)

(continued)

Accessing the VMS Status and VMS Control/Edit Windows

The *VMS Status* window can be accessed by left-clicking the **VMS** button in the Lower Status Bar at the bottom of the TMS monitor. The *VMS Control/Edit* window can be accessed by right-clicking the **VMS** button.

Creating a New Message (NOTE: Many symbols display differently on the VMS than on the screen when they are entered into a message. If you are using symbols in a message, make sure to *check the guide* in the front flap of this binder!)

1. Click on the **VMS** button in the Lower Status Bar. The *VMS STATUS* window will come up on the monitor screen.**
2. Click on the **CONTROL** button to get into the *VMS CONTROL/EDIT* window.**
3. Select a VMS by highlighting it from the *Item List* box and clicking the **CURRENT** button.
4. Click on the **MESSAGE** button to get into the *VMS MESSAGE/EDIT* window.
5. Click on the **NEW** button in the VMS window and enter the message title in the **CURRENT MESSAGE** box.
6. Tab or click into the **TEXT** boxes. Enter the text message in the **TEXT** boxes, then click **AUTO-CENTER** while the cursor is on each line. Compare the message with the **VMS PROBLEMS** sheet and ensure that your message accommodates the designated problems.
7. Enter phase time for each phase. To the left of each message box, there is a small box for the phase time entry in tenths of a second (i.e. 020 = 2.0 seconds, 025 = 2.5 seconds, etc.). (**Note:** The computer system will not accept a single-phase message with a phase time, since there is no need; nor will it accept a multi-phase message with any phase time missing.) Assign phase times that are multiples of 0.5 seconds only. The entire message should take a total of 4 seconds or less to completely display.
8. Click on **BACKLIGHT** for internal illumination and **BEACONS** for flashing beacons, as required by the message.
9. To test the message's effectiveness, select the **ANIMATE MSG** box in the upper right corner. The message will display in the top text box.
10. Click the **ACCEPT** button to **save this message before displaying it.**

Steps 1 and 2 can both be accomplished by clicking the right mouse button on the **VMS button on the Lower Status Bar.

Controlling Variable Message Signs (VMS)

(continued)

Displaying an Existing Message

1. Access the *VMS STATUS* window by clicking on the VMS button located in the Lower Status Bar.**
2. Click on the **CONTROL** button to get into the *VMS CONTROL/EDIT* window.**
3. Select a VMS by highlighting it from the *Item List* box and clicking the **CURRENT** button.
4. Click on the **MESSAGE** button located in the *Other Windows* box. The *VMS MESSAGE EDIT* window will appear.
5. Scroll through the *Message List*. Highlight the desired message to put on the selected VMS. Always verify the contents of the message accommodate the problems shown on the **VMS PROBLEMS** sheet. If there are discrepancies, make appropriate changes, accept it and re-check it before displaying. Click **OK** on the warning message if it appears.
6. Click on the **DISPLAY** button to display the message on the selected VMS.
7. Click on the **CONTROL** button located in the *Other Windows* box to return to the *VMS CONTROL/EDIT* window.
8. In the *VMS CONTROL/EDIT* window, click on the **STATUS** button to get into the *VMS STATUS* window. Check the message being displayed on the VMS. (**Note:** Click on the **ANIMATE MESSAGE** box for multi-phase messages.)

Steps 1 and 2 can both be accomplished by clicking the right mouse button on the **VMS button on the Lower Status Bar.

Blanking a Single VMS Display

1. Follow steps 1 - 3 above.
2. Click on the **BLANK** button located in the *Sign Control* box.
3. To check on the status of a VMS click on the **STATUS** button. This will take you back to the *VMS STATUS* window.

Controlling Variable Message Signs (VMS)

(continued)

Cluster Messages

A cluster is defined as a group of VMSs and their corresponding messages in a list. The cluster function will activate pre-determined messages on the pre-assigned VMSs.

Creating a New Cluster

(NOTE: In order to create a cluster, you must first be sure that the desired message to be displayed by each VMS is already created and stored in the memory of the appropriate VMS--see "Creating a New Message"). If the messages are already created and stored with the appropriate VMSs, then do the following to create a cluster:

1. Access the *VMS STATUS* window by clicking on the VMS button located in the Lower Status Bar.
2. Click on the **CONTROL** button to get into the *VMS CONTROL/EDIT* window.
3. Select a VMS by highlighting it from the *Item List* box and clicking the **CURRENT** button.
4. Click on the **CLUSTER** button.
5. Click on the **NEW** to create a new cluster.
6. Enter the name of the cluster in the *Current Item* box.
7. Select a VMS from the *Item List box* and Click on the **ADD** button.
8. Select the corresponding message for this VMS and click on the **ADD** button.
9. Repeat Steps 7 and 8 until all the signs and their corresponding messages in the cluster have been added.
10. Click on the **ACCEPT** button to store the new cluster.

Deleting a VMS from a Cluster

1. After step #4 from above, select the cluster to delete from and click on the **CURRENT** button.
2. Select the VMS in the cluster to be deleted, then click on the **DELETE** button.

Adding a VMS to a Cluster

1. Select the desired cluster from the list and hit the **CURRENT** button.
2. Click the on the **SIGN** button and select the VMS.
3. Click **ADD** after selecting the desired sign.
4. Select desired message and then hit **ACCEPT**.

Controlling Variable Message Signs (VMS) (continued)

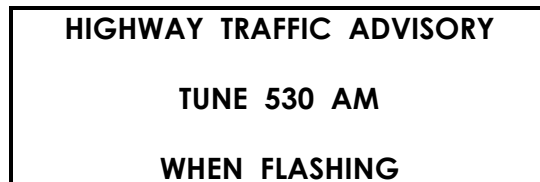
Executing a Cluster

1. After choosing **CLUSTER** from the *VMS CONTROL/EDIT* window select the desired cluster from the list and hit the **CURRENT** button.
2. Click on the **EXECUTE** button.
3. Return to the *VMS STATUS* window by clicking on the **STATUS** button and check that the cluster has been successfully executed.

Highway Advisory Radio (HAR)

Background

The Highway Advisory Radio is used to inform motorists of special events and conditions that may affect traffic in the Seattle area. The Northwest Region of WSDOT currently has nine HARs in the greater Puget Sound area. Each HAR has a transmitter station and corresponding signs with beacons (flashing lights) -- see the *HAR Location Map* at the end of this chapter. An example of the HAR sign (HARS) is shown below.



Maintenance and construction advisories are usually planned in advance, and this type of message will be published in the DIP. At the scheduled time printed in the DIP, the Flow Operator or Radio Operator enables these messages and activates the transmitters and HAR signs. In addition to these planned messages, messages pertaining to special traffic incidents or conditions that will seriously affect traffic for an extended duration of time should be recorded on the HAR.

The Flow Operator has the access to turn on the beacons at the various HAR signs.

The Flow Operator must also verify proper operations of all HARTs and HARSs and report to the Flow Engineers through the use of the SC&DI Trouble Report forms, as this is one of the daily checklist items.

Highway Advisory Radio (HAR)

(continued)

How Do HARTs and HARSs Work?

Each message slot is set at 30 seconds long. The various HAR transmitters/voice recorders have from 2 to 4 slots depending on the transmitter. The range of the HAR transmitter is approximately 1 mile radius from the physical location of the transmitter. This means that if there is an activated transmitter and only one message is enabled to be broadcast, then a driver traveling at 55 MPH will tune to 530 AM or 1610 AM (depending on the transmitter) after seeing a HAR sign with flashing beacons, and will receive the repeating message 3 to 4 times.

The Multiple Message Announcement Repeater allows the voice recorder to selectively play back or replace any of the messages in the 2 to 4 message slots. After one or more messages have been recorded in the voice recorder, one or more of the messages may be selected to be continuously repeated. The voice recorder will continue to repeat the enabled message(s), even while the phone line is inactive. There are currently 12 HARs accessible by telephone line (see list on next page).

Notice: Due to various technical reasons, the operator must increase their voice volume when recording HAR messages in order to make an audible message!! Review the procedures to access and operate HAR. The summary of the HAR commands are listed on page 78.

Highway Advisory Radio (HAR)

(continued)

A HAR transmitter (HART) can be used to broadcast messages when a particular HAR sign (HARS) in the vicinity is to be used--see HAR Location Map. The following table illustrates existing HARTs and corresponding HARSs.

HAR Transmitter	Location	Associated HAR Signs
HART-012 (530 AM)	Federal Way	Use VMS-008 NB (Display "Tune 530 AM" Message) Use VMS-021 SB (Display "Tune 530 AM" Message)
HART-064 (530 AM)	Tukwila (Sea-Tac)	HARS-053 (I-5 NB @ S 188th) HARS-079 (I-5 SB @ Norfolk St.) HARS-594* (SR-518 @ 32nd Ave. S)
HART-093 (530 AM)	Spokane St.	HARS-088* (I-5 NB @ Michigan St.) HARS-098* (I-5 SB @ Holgate St.)
HART-135 (530 AM)	NE 45th St.	HARS-142* (I-5 SB @ NE 58th St.) HARS-127 (Out of Service) (I-5 NB Ship Canal)
HART-203 (530 AM)	Swamp Creek	HARS-208 (SR 525 SB @ 164th SW) HARS-770* (I-5 SB @ 164th SW) HARS-196 (Static) (NB I-5 @ 40th Ave. W) HARS-759 (Static) (NB I-405 J/S Damson Rd)
HART-475 (1610 AM)	Monroe / Stevens Pass	HARS-293* (SR-522 EB) HARS-472* (US-2 EB)
HART-698 (530 AM)	Northup	HARS-536 (SR-520 WB @ NE 24th) HARS-520* (SR-520 EB @ 94th Ave. NE) HARS-694* (I-405 NB @ NE 10th) HARS-708 (Out of Service) (I-405 SB @ NE 53rd)
HART-908 (530 AM)	Eastgate ^Φ	HARS-662 (I-405 NB @ SE 52nd) HARS-680* (I-405 SB @ SE 13th St.) HARS-904* (I-90 EB @ 136th) HARS-912* (I-90 WB @ 164th Ave.)
HART-989 (530 AM)	Preston	Use VMS-990 WB (Display "Tune 530 AM" Message)

* The beacons on this HAR sign can be activated via direct telephone controls. The step-by-step procedures to activate these HARS are shown on page 68.

Φ If the pass report recorded in slot 1 of this HART is stale or incorrect, or if the message is not enabled or the transmitter not on, call Radio at 440-4491.

Highway Advisory Radio (HAR)

(continued)

Activating the HAR System

I. Gain Control

1. Dial the phone number of the desired HART.
2. As soon as you hear a low-pitch chirp or a voice message, press "#" firmly. You should hear a beep. If you still hear the low-pitch chirp or a voice, press "#" again until you hear a beep.

II. Record and Enable Message

3. Press the password code firmly to access the recorder. You should then hear a short chirp and then silence. This chirp tells you that you are now in the voice recorder program.
 - a) If you heard a low-pitch chirp in Step 1, that means this HART does not have any message recorded. Go to Step 4
 - b) If you heard a voice message, check to see which message slot number this message is recorded in. To do so, press 51 (to listen to message slot number 1), 52 (message slot number 2), etc. (NOTE: You don't have to listen to an entire message; you can interrupt by pressing "#".)
4. To start recording press **4 + message slot number**. Start recording after the beep. When finished recording, press "#" to terminate.
5. To review the message just recorded, press **5 + message slot number**. After the message is played, you should hear a chirp.
6. If the message recorded sounded satisfactory, press **6 + message slot number** to enable the message to be broadcast. If not, record over by pressing **4+ message slot number**.

III. Activate Transmitter

7. Check the transmitter status by pressing **03**. If you hear a steady tone, the transmitter is ON already. If you hear a chirp, the transmitter is OFF. (If there are no messages activated on a HART, then it should be turned OFF.)
8. Press **01** to turn the transmitter ON. Press **03** to check the transmitter status to make sure that the transmitter is ON. (Press **02** to turn the transmitter OFF.)
9. Press **99** to exit. You should hear a low-pitch chirp. Hang up.

IV. Activate Appropriate HARs

10. Turn on the HARs (HAR signs) by phone, except ones to be activated by radio.

Highway Advisory Radio (HAR)

(continued)

11. Make the necessary changes in the Excel spreadsheet on the center console to make note of the HARTs and HARSs in use and the corresponding event(s). To do this, go to the right center console. Select the MSOFFICE button, located in the top right corner of the screen, that is labeled "HAR". This will open the EXCEL spreadsheet used to keep track of HART and HARS status. The status of the transmitter and sign should match the status shown in this file. Make the appropriate changes whenever you use a HART or HARS. Be sure to click on **UPDATE** when completed.

Deactivating the HAR System

1. Turn off HARS before you turn off the corresponding HART (HARSs are turned off by phone or by radio depending on the HARS).
2. Access the HAR voice recorder (see steps 1 through 4 of "Activating the HAR System") and disable the message in the desired slot(s) by pressing **7+ message slot number**. Wait for a chirp. (If you won't be using the same recording again soon, record a blank in the slot by pressing **4 + message slot number**, then immediately, #. Check that the slot is blank by pressing **5 + message slot number**.)
3. If *all* slots are disabled, turn the transmitter OFF by pressing **02**. Check the transmitter status by pressing **03** to make sure it is off--you should hear a stuttering chirp.
4. Press **99** to exit the program. You should hear a low-pitch chirp. Hang up.

Highway Advisory Radio (HAR)

(continued)

HAR Recording Process Summary

command	function
#	To enter the voice recorder system. (It can also be used to terminate a process.)
4 + message slot number	Record in desired message slot
5 + message slot number	Play content in desired message slot
6 + message slot number	Enable the desired message to be broadcast
7 + message slot number	Disable the broadcast of the desired message slot
01	Turn transmitter ON
02	Turn transmitter OFF
03	Check transmitter status (Chirp = OFF, Tone = ON)
99	Exit from the voice recorder program

HAR Message Format

The standard format of a HAR message should be as follows. Once again, due to liability concerns, DO NOT recommend any specific alternate route in the message.

1. *"This is the Washington State Department of Transportation Highway Advisory Radio.*
2. *[Incident report],*
3. *Motorists are advised to [use alternate routes, expect delays/congestion, use caution, and/or move to the left/right when approaching the area].*
4. *KNEZ 390*, [location of the HART]."*

* OR *KNCL 518* for HART 064

Highway Advisory Radio (HAR)

(continued)

HAR Commands

The following commands are supported by the Dial Access Controller and Multiple Message Announcement Repeater:

<u>Command No.</u>	<u>Function</u>
01	Turn Transmitter On (primary user only)
02	Turn Transmitter Off (primary user only)
03	Check Transmitter Status
41	Record message #1 (primary user only)
42	Record message #2 (may not be accessible to secondary user)
43	Record message #3 (may not be accessible to secondary user)
44	Record message #4 (may not be accessible to secondary user)
45	Record message #5
46	Record message #6
47	Record message #7
48	Record message #8
50	Play all enabled messages
51	Play message #1
52	Play message #2
53	Play message #3
54	Play message #4
55	Play message #5
56	Play message #6
57	Play message #7
58	Play message #8
60	Enable all messages
61	Enable message #1
62	Enable message #2
63	Enable message #3
64	Enable message #4
65	Enable message #5
66	Enable message #6
67	Enable message #7
68	Enable message #8
70	Disable all messages
71	Disable message #1
72	Disable message #2
73	Disable message #3
74	Disable message #4
75	Disable message #5
76	Disable message #6
77	Disable message #7
78	Disable message #8
99	Exit from programming mode

Highway Advisory Radio (HAR)

(continued)

HAR Location Map

Handling Major Accidents

According to the Major Accident Investigation Team (MAIT), a minor accident is one that involves only property damage that does not exceed \$500 (estimated). A major accident is anything else. (For example: accidents involving severe personal injuries, fatalities, MAIT, property damages beyond \$500, or any state vehicle.)

The following guidelines represent an effective strategy to handle such a situation. The more severe the accident, the more important it is to follow each step.

1. If the source of this information comes from WSP's CAD log, Radio Dispatchers, or a phone call from the public, confirm the incident using CCTVs, when applicable.
2. Inform the Radio Dispatchers of the incident and any additional information (which lanes are blocked, how many cars are involved, etc.).
3. Once confirmed with CCTVs, inform the Flow Engineer. Then he/she will inform the Operations Engineers.
4. Effectively and efficiently use VMSs and HARs at appropriate locations--use your engineering judgment and common sense. Confirm your strategy with the Flow Engineer.
5. Send an addressable message to the media informing them of the incident.
6. Update the traffic reports, advising the motorists to expect delays, or if possible, use alternate routes (but do not recommend any specific alternate routes, due to concerns of liability). DO NOT report any fatalities or status of injured individuals.
7. Consider other options such as:

Activating Ramp Meters

When a major accident causes severe backups and congestion, it may be wise to activate ramp meters upstream from the accident location. If time-of-day tables allow it, appropriately meter affected locations. If time-of-day tables do not permit metering at the time, consult with the Flow Engineer on duty. He or she has the authority to override the existing time-of-day tables for ramp meters and turn them on at any time.

Express Lanes Direction

If a severe accident occurs on I-5 or I-90, the direction of the freeway's Express Lanes could have a dramatic affect on traffic flow through the area. If an accident occurs just prior to a change in the Express Lanes' status, consult with the Flow Engineer on duty and consider postponing the change, or beginning it earlier, depending on the effects of the accident. The Flow Engineer has the final call on this matter.

Monitoring the Convention Center and Tunnels for Fire Control

WSDOT Seattle Radio must monitor the Washington State Convention/Trade Center 24 hours a day, 7 days a week. When there is an incident with flame or smoke in the tunnels or convention center, do the following:

1. Inform the Radio Operator on duty in the Radio Control Room immediately. He or she knows the proper procedure to follow and is responsible for contacting the fire department and/or spraying foam.
2. Notify the Flow Duty Engineer at his or her desk. If this occurs after-hours, page or otherwise notify the Duty Engineer immediately.
3. Notify Public Affairs.
4. Put up HARTs and VMSs to notify motorists. Keep the media informed of what is going on, since they will be helpful in informing motorists.

Trouble Reporting of SC&DI Equipment

One important aspect of your flow duties is to find equipment problems and notify the proper individuals about the problems. An important thing to remember is that even the smallest equipment problem in the field or back room requires time and equipment to look at it and fix it. Make sure that equipment really does have a problem before you start trouble reporting it, make sure you are not duplicating previous reports, and make sure your descriptions of the problem are concise and accurate.

When in doubt about whether or not you should trouble report something, ask one of the Flow Engineers about the problem.

Following is a listing of when you should trouble report equipment:

Data Stations (ES) – Report when they have failed communication status for more than 10-20 minutes and inform a flow engineer if the data station is used for ramp metering. If a whole block of stations goes out, inform a flow engineer about the problem.

Ramp Meters (signals & loops) – Report as soon as you discover there is a problem. Inform a flow engineer so they can talk to Maintenance. Most ramp meters are used at least once every 24 hours, so do your part to make their downtime as small as possible.

Regular induction loops – These should only be trouble-reported by the weekend flow operators. When problems occur with loops during the week, simply disable them. Loop failures happen quite frequently, and they often fix themselves without requiring maintenance to do anything. You don't usually need to inform a flow engineer about loop problems.

VMS – Report when a VMS experiences communication failure and inform a flow engineer. Whenever you discover a problem with backlighting, dead cells or broken beacons, update the VMS database to reflect the problem, but don't trouble report it. Maintenance is sent a copy of this database periodically; this database helps them properly allocate their limited VMS repair resources.

HARS/HART – Report when there are problems. Inform a Flow Engineer if the problem is urgent and impedes the operation of the HAR.

CCTVs – Report when you discover a problem. Since this is done on a daily basis, a camera problem should appear in the trouble reports within 24 hours. Sometimes, the camera can be fixed from here, so inform a Flow Engineer about the problem prior to trouble reporting it.

Detecting and Handling Loop Failures

Background

A loop is a 6' by 6' wire induction loop that, when powered, produces an electromagnetic field that detects the presence of metal objects. Mainline freeway loops are placed in the center of lanes to detect moving vehicles. As loops detect vehicles passing, the data is transmitted to the roadside cabinets. This data is then translated into values of volume (total number of vehicles), lane occupancy (percentage of time a loop is occupied), and speed (not available at all locations). Occupancy values are averaged over the lanes at cabinet locations and transmitted to the VAX (TSMC's central computer) via fiberoptic cables or leased phone lines. This average value is used to "paint" the flow map with colors that correspond to specific occupancy values, providing a quick, accurate summary of traffic congestion status at specific locations.

Detecting Hung Loops

Occasionally, loops will malfunction as a result of broken induction wires, wiring connection problems, power supply problems, communication problems with the VAX, or a loop amplifier malfunction. Loops in such conditions are termed, 'hung' and will report occupancies of 100% (or slightly less) and volumes of 0. It is important to prevent hung loops from affecting the TSMC operations. Hung loops will provide false information to users of the flow map and could unnecessarily affect ramp metering rates, if meters are on. Every loop is individually checked each weekend to verify that it is reporting reasonable data.

Throughout the week, Flow Operators are to inspect suspicious loops. Hung loops will cause their corresponding cabinets to report abnormally high average occupancies, which in turn will often cause the flow map to display colors incorrectly indicating heavy or stop-and-go traffic conditions. Flow Operators should question the legitimacy of the reported data when the flow map shows a single segment of red or black, surrounded by areas of green. To inspect the loops at the ES under question, simply use the mouse to click on the segment. Inspect the contents of the right box called, **Loop Data**. Loops displaying bad data must be disabled by clicking in the **Disable** button.

Detecting and Handling Loop Failures

(continued)

Re-setting/Disabling a Hung Loop

All malfunctioning loops must be handled by first resetting the loop amplifier before disabling. When you click **Reset**, a pulse goes through the entire cabinet, simulating a “hit” on each of the loops in the cabinet. Only click **Reset** one time, since you will mess up the traffic counts if you repeatedly press it.

If after a few minutes the loop is still "hung", disable the loop by clicking **Disable**. Do not fill out a SC&DI trouble report. Reporting hung loops is performed during the weekend shifts (see page 85).

Note: In the *Loop Data Display* window, the status column will display and indicate the status of the loop and also gives a description of bad or suspicious data. A single character is used (under the S column) to indicate bad loops and why they are bad. The following is a list of the keys to these single characters.

Character	Condition
(blank)	Good Data
S	Short Pulse
C	Chattering Amplifier
E	Envelope, outside of vol-occ
4	Reserved*
5	Reserved*
L	Disabled by VAX
D	Disabled by operator
B	Bad loop - unspecified cause

* = If you see this character displayed, please note important details on the SC&DI Trouble Report form(s) and report to the Software Engineer immediately.

Detecting and Handling Loop Failures

(continued)

Reporting Hung Loops

This routine is done by the weekend Flow Operators.

Enabling a (Previously Hung) Loop

As you do your flow duties and go through the weekend loop checklist, you may come across loops that appear to be operational (good data) but are disabled. If the data appears to be normal, enable the loops.

Double-click on the desired cabinet in the **Cabinets – TMS98** window. The Loop Data window will come up. Highlight the desired loop to enable, and click on the **Enable** button. Wait 20 seconds and verify that the status no longer reads **L** or **D**.

Obtaining Call Counts

To keep track of the number of DOT-HIWY information line users and which recordings are used most, there is a software program written specifically for this purpose. Use the left flow console to obtain call counts. As a general rule, call counts are obtained at the end of the day. Follow the instructions below to record daily call counts.

1. On the desktop, click on the "CALL COUNTS 02" icon to launch the program.
2. Select the "CALL ECHODYNE" button. The modem will now call the Echodyne recorder. If the line is busy, try again in a few minutes. While you are dialing in, the traffic reports cannot be updated, so don't take forever.
3. When the modem connects and the Echodyne responds with "PASSWORD" prompt on the screen, enter the password.
4. Now select the "DOT-HIWY COUNTS" and record the total number of calls.
5. Continue clicking through each button, recording the total number of calls for each path.
6. When you are done, select **Hangup** from the **Phone** pull-down menu. If you don't hang up the line, it takes approximately 2 minutes to reset.



7. **EXIT** the program.

Traffic Volume Data Retrieval

TSMC often receives traffic volume data requests from other public agencies and private sectors. Currently, there are four ways of retrieving traffic data (volume and occupancy) that each apply to different time periods. Use each for the following applications:

RETRIEVAL METHOD	TIME PERIOD
VAX Data Retrieval (VDR)	Within the past 6 months
CD ROM Data Retrieval (CDR)	Between 1993 and 6 months ago
Dated Diskettes	February 1, 1991 to May 21, 1993
Perkin-Elmer Tapes	1978 to 1992

Loop Naming Scheme

Loop Naming Scheme

The following section is taken out from the SC&DI Design Guide (pages 50-54).

A loop name contains exactly seven characters. The underscores are considered characters and are therefore necessary. A loop name is found by selecting one item from each column in table # 1 (Roadway, Direction, Lane Type, and Lane Number). These items are then combined into a loop name. The correct item is found by following the conventions in the list of rules below. Special loops that need to be identified to the 170 controller at each ES station/cabinet are shown in table #2.

Speed loops must also be identified to the 170 controller. These loops are identified by XXXXXSX. To find the corresponding loop for the trap, match each X in XXXXXSX to each X in XXXXXTX.

Table 1. (Loop Naming Scheme)

Roadway *	Direction	Lane Type	Lane Number
<u>M</u> - Mainline	<u>S</u> - Southbound (SB)	<u>X</u> - Exit Ramp	<u>1</u>
<u>C</u> - Collector/Distributor	<u>N</u> - NB	<u>O</u> - On-Ramp	<u>2</u>
<u>R</u> - Reversible	<u>E</u> - EB	<u>RA</u> - Right Advance Queue	<u>3</u>
<u>AM</u> - Auxiliary Mainline	<u>W</u> - WB	<u>LA</u> - Left Advanced Queue	<u>4</u>
<u>AC</u> - Auxiliary C/D		<u>Q</u> - Queue Loop	<u>5</u>
<u>AR</u> - Auxiliary Reversible		<u>I</u> - Intermediate Queue Loop	<u>6</u>
<u>MM</u> - Metering Mainline		<u>D</u> - Demand Loop	<u>7</u>
<u>MC</u> - Metering C/D		<u>P</u> - Passage Loop	<u>8</u>
<u>MR</u> - Metering Reversible		<u>HX</u> - HOV Exit Ramp	<u>9</u>
		<u>HO</u> - HOV On-Ramp	<u>S1</u> - Speed Loop L-1
		<u>HD</u> - HOV Demand Loop	<u>S2</u> - Speed Loop L-2
		<u>HP</u> - HOV Passage Loop	<u>S3</u> - Speed Loop L-3
		<u>H</u> - HOV Mainline	<u>S4</u> - Speed Loop L-4
		<u> </u> - Mainline	<u>S5</u> - Speed Loop L-5
			<u>S6</u> - Speed Loop L-6
			<u>S7</u> - Speed Loop L-7
			<u>S8</u> - Speed Loop L-8
			<u>S9</u> - Speed Loop L-9

*"A" is used for multiple roadways for one cabinet (i.e. SR-167 and I-405).

"M" is used when the loop is used in figuring meter rates. Otherwise an underscore is used.

Loop Naming Scheme

(continued)

Table 2. (Special Loop Names)

Function Name	Lane 1	Lane 2	Lane 3
Passage	XXX_P_1	XXX_P_2	XXX_P_3
Demand	XXX_D_1	XXX_D_2	XXX_D_3
Intermediate Queue	XXX_I_1	XXX_I_2	XXX_I_3
Queue	XXX_Q_1	XXX_Q_3	XXX_Q_3
Adv. Queue Right	XXXRA_1	XXXRA_2	XXXRA_3
Adv. Queue Left	XXXLA_1	XXXLA_2	XXXLA_3
Station Loops	MXXXXXX	MXXXXXX	MXXXXXX
HOV Demand	XXXHD_1	XXXHD_2	XXXHD_3

Loop Naming Scheme

(continued)

Sample Loop Naming Scheme Diagram

Using the VCR for Videotaping

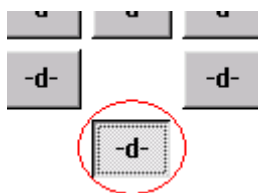
Occasionally, the TSMC receives a request to videotape a traffic incident or construction event in progress. Other times, traffic studies are made of certain stretches of highway within the view of a camera. Sometimes taping will be planned; other times it will be impromptu.

Videotaping:

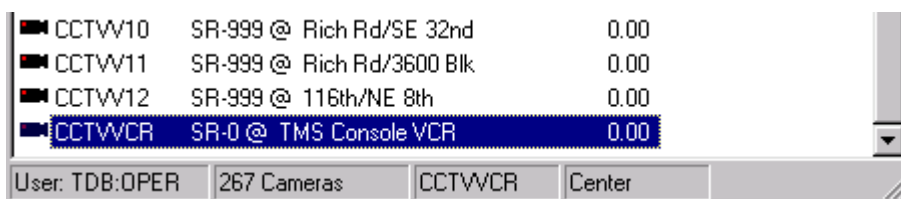
1. Obtain a videotape from the closet/cabinet, and put it into the VCR (center).
2. In the **Camera Control – TMS98** window, select the **Monitor Views** pull-down menu, and then select **TSMC Center**.



3. Click on the bottom center monitor (VCR), and then click on the desired camera. The VCR is now receiving the video feed from that camera.



4. To display the CCTV camera image being recorded, scroll down to the very bottom of the camera list to the TMS Console VCR. Display this camera on one of the TV monitors – you will notice that there is a time stamp displayed on the video feed.



5. Press **RECORD**. Taping begins immediately. When the recording period is over, press **STOP**. Rewind the tape and press the **EJECT** button to retrieve the videotape.
1. Clearly label the tape using the tape label sticker. Make sure to write down the:
 - Description, date, and location of incident
 - Name of the person who requested the tape (if the tape is to be sent out)

Appendix A – Echodyne Information

The following is a list of available message slots and their corresponding messages for the DOT-HIWY voice-recording program. Notice that the time constraint for a specific message is also listed next to the message slot number.

SLOT 1 MESSAGE	5 SECONDS
<i>Thank you for calling the Washington State Department of Transportation Commuter Information Line.</i>	

SLOT 5 MESSAGE	20 SECONDS
<i>NOT USED</i>	

SLOT 6	20 SECONDS
<i>NOT USED</i>	

SLOT 9 MESSAGE	60 SECONDS
<i>You may make your selection at anytime during this menu, For a current Seattle area traffic report, press 1, For Emergency Road Closure Information for King, Snohomish, Skagit, Island, and Whatcom Counties, press 2, for freeway and local road construction and information, press 3, for the update to normal ferry schedules, press 4, for transit and carpool information, press 5, for information regarding our Internet web site, press 6, and to return to the main menu, press 7.</i>	

SLOT 11	5 SECONDS
Greeting message recorded by the TSMC.	

SLOT 12	180 SECONDS
Traffic Report recorded by the TSMC.	

SLOT 13	180 SECONDS
Emergency road conditions or repeat messages recorded by the TSMC.	

SLOT D	180 SECONDS
SWAP message slot for slots 12 and 13.	

SLOT E	10 SECONDS
Express Lane status report recorded by TSMC.	

Appendix A – Echodyne Information

(continued)

SLOT 16 MESSAGE	25 SECONDS
<i>The Seattle area traffic report covers accidents and traffic congestion on major Seattle freeways between Lynnwood and Tukwila. Freeway congestion, express lane status, and other traffic impacts are reported 6 AM to 7 PM weekdays, and from 9 AM until 6 PM on weekends. The report is updated as conditions change.</i>	
SLOT 17 MESSAGE	10 SECONDS
<i>To replay this message and terminate your call Press 1, to return to the main menu press 2, to end this call, press 3.</i>	
SLOT 21	5 SECONDS
Greeting message for Tacoma recorded by Olympic Radio.	
SLOT 22	180 SECONDS
Tacoma area incident report recorded by Olympic Radio.	
SLOT 23	180 SECONDS
Tacoma area emergency or repeat message recorded by Olympic Radio.	
SLOT 24	180 SECONDS
SWAP message slot for slots 22 and 23.	
SLOT 25 MESSAGE	25 SECONDS
<i>The Tacoma area incident report, reports accidents and other traffic impacts for Tacoma and surrounding areas 24 hours a day and is updated as conditions change.</i>	
SLOT 31 MESSAGE	10 SECONDS
<i>You have selected the freeway and local road construction report.</i>	
SLOT 32 MESSAGE	10 SECONDS
<i>For information regarding state highways, press 1, for local roadway information, press 2.</i>	
SLOT 41 MESSAGE	15 SECONDS
<i>For construction information on Interstate 5, press 1, for Interstate 90, press 2, for Interstate 405, press 3, and for other state routes, press 4.</i>	

Appendix A – Echodyne Information

(continued)

SLOT 42	270 SECONDS
Interstate 5 construction report recorded by CTCO.	

SLOT 43	270 SECONDS
Interstate 90 construction report recorded by CTCO.	

SLOT 44	270 SECONDS
Interstate 405 construction report recorded by CTCO.	

SLOT 45	270 SECONDS
Other state routes construction report recorded by CTCO.	

SLOT 46	270 SECONDS
Swap slot for slots 42, 43, 44, 45.	

SLOT 47	25 SECONDS
<i>To replay this message and terminate your call Press 1, to return to the state highway construction menu for King, Snohomish, Skagit, and Whatcom counties press 2, to return to the general road construction and information menu press 3, to return to the main menu press 4, and to end this call, press 5.</i>	

SLOT 61 MESSAGE	30 SECONDS
<i>For information on county roads in King County please call 205-9150, for information on city streets in the City of Seattle call 684-ROAD, and for information on city streets in the City of Bellevue call 637-7933.</i>	

SLOT 62 MESSAGE	15 SECONDS
<i>To replay this message and terminate your call press 1, to return to the general road construction and information menu press 2, to return to the main menu press 3, to end this call press 4.</i>	

SLOT 81 MESSAGE	10 SECONDS
<i>You have selected the Washington State Ferries information report.</i>	

SLOT 82	120 SECONDS
Washington State Ferries report recorded by WSDOT Ferries.	

SLOT 83	120 SECONDS
Swap slot for slot 83.	

Appendix A – Echodyne Information

(continued)

SLOT 84 MESSAGE	20 SECONDS
<i>The current update to normal ferry schedules reports changes and disruptions to the daily ferry runs and is updated as conditions change. For further information please call the 24-hour hotline at 464-6400.</i>	
SLOT 85 MESSAGE	10 SECONDS
<i>To replay this message and terminate your call press 1, to return to the main menu press 2, to end this call press 3.</i>	
SLOT 91 MESSAGE	10 SECONDS
<i>Maximum call duration has expired and your call is being terminated. Please call again.</i>	
SLOT 92 MESSAGE	5 SECONDS
<i>Your choice is invalid for this menu. Please try again.</i>	
SLOT 93 MESSAGE	5 SECONDS
<i>No choice has been made. Thank you for calling.</i>	
SLOT 94 MESSAGE	5 SECONDS
<i>Good-bye, and thank you for calling.</i>	
SLOT 95 MESSAGE	5 SECONDS
<i>Begin recording after the tone. To end your recording press the pound key.</i>	
SLOT 96 MESSAGE	5 SECONDS
<i>Your recording has been accepted. Returning to main recording options.</i>	
SLOT 97 MESSAGE	5 SECONDS
<i>To listen to your recording press 1, to accept your recording press 2, to re-record press 3.</i>	
SLOT 101 MESSAGE	10 SECONDS
<i>You have selected the transit and carpool information report.</i>	
SLOT 102 MESSAGE	10 SECONDS
<i>For Metro information, press 1, and for commuter information, press 2.</i>	
SLOT 103	120 SECONDS
Metro transit report recorded by Metro	

Appendix A – Echodyne Information

(continued)

SLOT 104	120 SECONDS
Swap slot for slot 103.	

SLOT 105 MESSAGE	120 SECONDS
<i>Be Oil Smart! Share the ride. For Metro carpool and vanpool services hotline call 625-4500. For Metro rider information and trip planning call 553-300.. During severe weather conditions, please listen to the radio for updated information as this line does become very busy. For Metro schedule information please call 287-8463. You will need to call from a touchtone phone, know the bus route number, and the bus stop location.</i>	

SLOT 106	120 SECONDS
Swap slot for slot 105.	

SLOT 107 MESSAGE	15 SECONDS
<i>To replay this message and terminate your call, press 1, to return to the transit and carpool menu, press 2, to return to the main menu, press 3, and to end this call, press 4.</i>	

SLOT 111 MESSAGE	10 SECONDS
<i>You have selected information regarding the Washington State Department of Transportation's Internet web site.</i>	

SLOT 112 MESSAGE	60 SECONDS
<i>A congestion map and pictures of freeway conditions are available to individual computer users on the Internet. Links to this information can be found on the Department of Transportation's homepage located at www.wsdot.wa.gov.</i>	

SLOT 113 MESSAGE	10 SECONDS
<i>To replay this message and terminate your call, press 1, to return to the main menu, press 2, and to end this call, press 3.</i>	

SLOT 200 MESSAGE	60 SECONDS
<i>This is the Washington State Department of Transportation Mountain Pass Road report, brought to you by REI your headquarters for snow-sports gear and clothing in Seattle, Bellevue, Lynnwood, Federal Way, and Spokane. You may enter your selection at any time. For I-90 Snoqualmie Pass Press 1, for US 2 Steven's Pass, US 97 Blewitt Pass, or US 12 White Pass Press 2; for State Route 542 Mount Baker Highway, US 97 Satus Pass, or State Route 20 Sherman Pass Press 3; for State Route 410, Crystal Mount Blvd., State Route 20 North Cascades Highway, State Route 123 Cayuse Pass, or State Route 410 Chinook Pass Press 4; or for the city and phone number of REI stores in Washington State press 5.</i>	

Appendix A – Echodyne Information

(continued)

SLOT 201	90 SECONDS
Snoqualmie Pass Report recorded by Seattle Radio.	
SLOT 202	90 SECONDS
Stevens, Blewitt, and White Pass Reports recorded by Seattle Radio.	
SLOT 203	90 SECONDS
Mt. Baker, Satus, and Sherman Pass Reports recorded by Seattle Radio.	
SLOT 204	90 SECONDS
SR410, Crystal Mtn Blvd, N. Cascades Hiwy., Cayuse, and Chinook Pass Reports recorded by Seattle Radio.	
SLOT 205	90 SECONDS
SWAP slot for slots 201, 202, 203, and 204.	
SLOT 206	90 SECONDS
Closed Passes recorded by Seattle Radio.	
SLOT 209 MESSAGE	15 SECONDS
<i>To replay this message and terminate your call Press 1, to return to the mountain pass menu press 2, for the city and phone number of REI stores in Washington State press 3, or to end this call press 4.</i>	
SLOT 210 MESSAGE	20 SECONDS
<i>To replay this message and terminate your call press 1, to return to the mountain pass menu press 2, to return to the main menu press 3, for the city and phone number of REI stores in Washington State press 4, or to end this call press 5.</i>	
SLOT 211 MESSAGE	90 SECONDS
<i>At REI you'll find the gear and clothing for skiing and snowboarding plus climbing, hiking, cycling and paddling. Call to check the merchandise assortment at the store you're interested in. REI has 6 stores in Washington to serve you. Seattle: (206)223-1944 Bellevue: (425)643-3700, Federal Way (253) 941-4994, Lynnwood: (425) 774-1300, Spokane: (509) 328-9900. Our Approach store at Bellevue Square also offers a wide selection of clothing plus Internet access to our complete selection of REI gear and clothing. Reach approach at (425) 462-9798. You can also shop REI on the Internet at www.rei.com; or through our Mail Order catalog. Call 1-800-426-4840 to receive your free REI catalog. Thank you for your interest in REI.</i>	
SLOT 212	90 SECONDS
SWAP Slot for slot 211.	

Appendix A – Echodyne Information

(continued)

SLOT 213 MESSAGE	20 SECONDS
<i>To replay this message and terminate your call press 1, to return to the mountain pass menu press 2, or to end this call press 3.</i>	
SLOT 214 MESSAGE	20 SECONDS
<i>To replay this message and terminate your call press 1, to return to the mountain pass menu press 2, to return to the main menu press 3, or to end this call press 4.</i>	
SLOT 301	180 SECONDS
Emergency Road Closure Report recorded by Seattle Radio.	
SLOT 302	180 SECONDS
Swap slot for 301	
SLOT 303 MESSAGE	10 SECONDS
<i>To replay this message and terminate your call, press 1, to return to the main menu, press 2, or to end this call, press 3.</i>	
SLOT 400	15 SECONDS
<i>To record highway condition reports press 1, to record construction reports press 2 or press 3 to hang-up.</i>	
SLOT 403	30 SECONDS
<i>Press 1 for traffic and highway condition reports in Pierce and Thurston counties, press 2 for highway condition reports in Greys Harbor, Mason, Jefferson, Clallam and Kitsap Counties, press 3 for construction reports, press 4 for updates to normal ferry schedules, press 5 to return to the main menu or to end this call press 6.</i>	
SLOT 405	30 SECONDS
<i>Press 1 for highway condition reports, press 2 for construction reports, press 3 for updates to normal ferry schedules, press 4 to return to the main menu or to end this call press 5.</i>	
SLOT 411	240 SECONDS
**Olympic region emergency road closure report. RECORDED BY OLY RADIO.	
SLOT 412	240 SECONDS
<i>To record construction reports for I-5 and I-705 press 1, for Highway 101 press 2, for Highway 16 press, 3 for other routes press 4, to return to the previous menu press 5 or to end this call press 6.</i>	

Appendix A – Echodyne Information

(continued)

SLOT 413	40 SECONDS
<i>For construction and road closure information on Interstate 5 and 705, press 1, for US Highway 101, press 2, for state highway 16, press 3, for other state routes press 4, to return to the Olympic Region menu press 5, to return to the main menu press 6 or to end this call press 7.</i>	
SLOT 414	240 SECONDS
**I-5 and I-705 construction report. RECORDED BY OLYMPIC RADIO.	
SLOT 415	240 SECONDS
**Highway 101 construction report. RECORDED BY OLYMPIC RADIO.	
SLOT 416	240 SECONDS
**Highway 16 construction report. RECORDED BY OLYMPIC RADIO.	
SLOT 417	240 SECONDS
**Other highways construction report. RECORDED BY OLYMPIC RADIO.	
SLOT 422	10 SECONDS
<i>To listen to your recording press 1, to accept your recording press 2, to re-record press 3, to return to the previous menu press 4 or press 5 to hang-up.</i>	
SLOT 500	15 SECONDS
<i>To record emergency closures press 1 or to end this call press 2.</i>	
SLOT 503	30 SECONDS
<i>Press 1 for emergency highway closures, press 2 to return to the main menu or press 3 to hang-up.</i>	
SLOT 511	240 SECONDS
**SW Region emergency road reports. RECORDED BY SW REGION.	
SLOT 520	25 SECONDS
Not Used at this time.	
SLOT 600	15 SECONDS
<i>Press 1 to record highway conditions report or to end this call press 2.</i>	
SLOT 603	30 SECONDS
<i>For emergency highway closures and road conditions on major Interstates and U.S routes press 1, to return to the main menu press 2 or to end this call press 3.</i>	
SLOT 611	240 SECONDS
** Eastern Region road report. RECORDED BY EASTERN REGION.	

Appendix A – Echodyne Information

(continued)

SLOT 620	25 SECONDS
Not Used at this time.	
SLOT 700	15 SECONDS
<i>To record I-82 road reports press 1, to record emergency closures press 2 or to end this call press 3.</i>	
SLOT 703	30 SECONDS
<i>Press 1 for road conditions on Interstate 82 between Ellensburg and Yakima, press 2 for emergency highway closures, press 3 to return to the main menu or to end this call press 4.</i>	
SLOT 711	240 SECONDS
** SC Region emergency construction report. RECORDED BY SC REGION.	
SLOT 712	240 SECONDS
** SC Region I-82 road conditions. RECORDED BY SC REGION.	
SLOT 720	30 SECONDS
Not used at this time.	
SLOT 800	15 SECONDS
<i>To record emergency closures press 1 or to end this call press 2.</i>	
SLOT 803	30 SECONDS
<i>Press 1 for emergency highway closures, press 2 to return to the main menu or to end this call press 3.</i>	
SLOT 811	240 SECONDS
** NC Region emergency construction report. RECORDED BY NC REGION.	
SLOT 820	30 SECONDS
Not used at this time.	
SLOT 900	10 SECONDS
<i>Thank you for calling the Washington State Department of Transportation's Highway Information Line.</i>	
SLOT 901	40 SECONDS
<i>If you know the extension you wish to hear, please enter it now.[PAUSE 2 SECONDS] For mountain pass reports press 1, for information regarding the Seattle area press 2, for information regarding Pierce and Thurston Counties press 3, for the rest of Western Washington press 4 and for Eastern Washington press 5.</i>	

Appendix A – Echodyne Information

(continued)

SLOT 905	40 SECONDS
<i>Press 1 for highway information in Northwest Washington which includes King, Snohomish, Island, Skagit, Whatcom and San Juan counties. Press 2 for highway information in, Mason, Kitsap, Grays Harbor, Jefferson and Clallam counties. Press 3 for Southwest Washington which includes Clark, Lewis, Skamania, Cowlitz, Klickitat, Wahkiakum and Pacific counties.</i>	
SLOT 906	30 SECONDS
<i>Press 1 for highway information in Northeast Washington, which includes Spokane, Adams, Lincoln, Stevens, Pend Oreille, Ferry and Whitman counties. Press 2 for North Central Washington which includes Okanogan, Chelan, Douglas and Grant counties. Press 3 for South Central Washington which includes Yakima, Kittitas, Benton, Franklin, Walla Walla, Columbia, Garfield and Asotin counties.</i>	
SLOT 912	20 SECONDS
<i>For the Olympic Region Press 1, for the SW Region press 2, for the Eastern Region press 3, for the South Central Region press 4, for the North Central Region press 5 or to quit press 6.</i>	

Appendix B – Ramp Meter Information

Interstate 5 northbound	Milepost	HOV
Southcenter Pkwy - NB (2 meters)	154.65	◇
Interurban - NB	156.02	◇
MLK Jr Way - NB	157.13	◇
Boeing Access - NB (2 meters)	157.82	◇
Swift Ave - NB	161.19	◇
Michigan St - NB (2 meters)	161.40	◇
Columbian Way - NB	163.10	◇
4th Ave - NB	164.66	
Dearborn St - NB	164.66	
University St. - NB (2 meters)	165.75	
Olive Way - NB (inactive)	166.21	◇
NE 45th St - NB	169.49	◇
NE 50th St - NB	169.79	◇
NE 70th St - NB	170.76	◇
NE 80th St - NB	171.49	◇
Northgate - NB (2 meters)	172.88	◇
NE 145th St - NB	174.58	◇
NE 175th St - NB	176.12	◇
SR 104 - NB	178.26	◇
220th St SW - NB (2 meters)	179.30	◇
Alderwood Mall Pkwy - NB (2 meters)	181.52	
196th St SW - NB (2 meters)	181.70	
164th St SW - NB (2 meters)	183.95	
Interstate 5 southbound	Milepost	HOV
128th St SW - SB (2 meters)	186.34	◇
164th St SW - SB (2 meters)	183.95	◇
Swamp Creek (NB I-405) - SB	182.30	
Swamp Creek (SB SR-525) - SB	182.30	◇
196th St SW - SB	181.10	◇
44th Ave W - SB (2 meters)	180.65	◇
220th St SW - SB	179.26	◇
244/236th St SW - SB (2 meters)	177.75	◇
NE 205th St - SB (2 meters)	177.75	◇

Metro Base - SB (inactive)	175.50	◇
NE 175th St - SB	176.07	◇
NE 130th St - SB	173.71	◇
NE 110th St - SB	172.86	◇
NE 107th St - SB	172.66	◇
N 85th St - SB	171.38	◇
NE Ravenna Blvd - SB (HOV to express)	170.00	◇
NE 50th St - SB	169.47	
NE 45th St - SB	169.29	◇
Boylston Ave - SB	167.69	
Mercer St - SB (inactive)	166.66	
SB CD - SB (inactive)	164.58	
4th Ave S - SB	164.41	
Columbian Way - SB	162.84	
Michigan St - SB (2 meters)	161.07	◇
MLK Jr Way - SB	157.12	◇
SR 599 - SB (inactive)	155.91	
SR 518/Klickitat - SB (2 meters)	154.14	◇
Interstate 90 eastbound	Milepost	HOV
Rainier - EB (2 meters)	3.41	◇
Island Crest Way - EB (2 meters)	7.24	
E Mercer Way - EB	8.40	◇
Interstate 90 westbound	Milepost	HOV
Front St. - WB (2 meters)	17.00	◇
SR 900 - WB (3 meters)	15.79	◇
W. Lk Sammamish Pkwy - WB	13.44	◇
Eastgate - WB (2 meters)	11.45	◇
Richards Rd - WB (2 meters)	9.97	◇
Bellevue Way - WB	9.22	◇
E Mercer Way - WB	8.27	◇
Island Crest Way - WB	7.02	
76th Ave. SE - WB	6.70	
W Mercer Way - WB	6.01	◇

Interstate 405 northbound	Milepost	HOV
W Valley Highway - NB	0.94	◇
SR 169 - NB	4.11	
Sunset Blvd - NB	4.70	◇
NE Park Dr - NB	5.41	◇
NE 30th St - NB	6.52	◇
NE 44th St - NB	7.48	
SE 8th St - NB	12.85	◇
NE 4th St - NB	13.57	◇
NE 8th St - NB (2 meters)	13.76	◇
NE 72nd St - NB (2 meters)	17.46	◇
NE 85th St - NB	18.24	◇
Totem Lake - NB (3 meters)	20.47	
NE 160th St - NB	22.75	◇
EB SR 522 - NB (inactive)	23.70	
NE 195th St - NB (2 meters)	24.62	◇
Interstate 405 southbound	Milepost	HOV
NE 195th St - SB (2 meters)	24.39	◇
EB SR 522 - SB	23.00	◇
NE 160th St - SB	22.46	◇
NE 124th St - SB (3 meters)	20.26	◇
NE 116th St - SB (2 meters)	19.73	◇
NE 85th St - SB (2 meters)	17.99	◇
NE 72nd St - SB	17.23	◇
NE 4th/8th - SB (3 meters)	13.58	◇

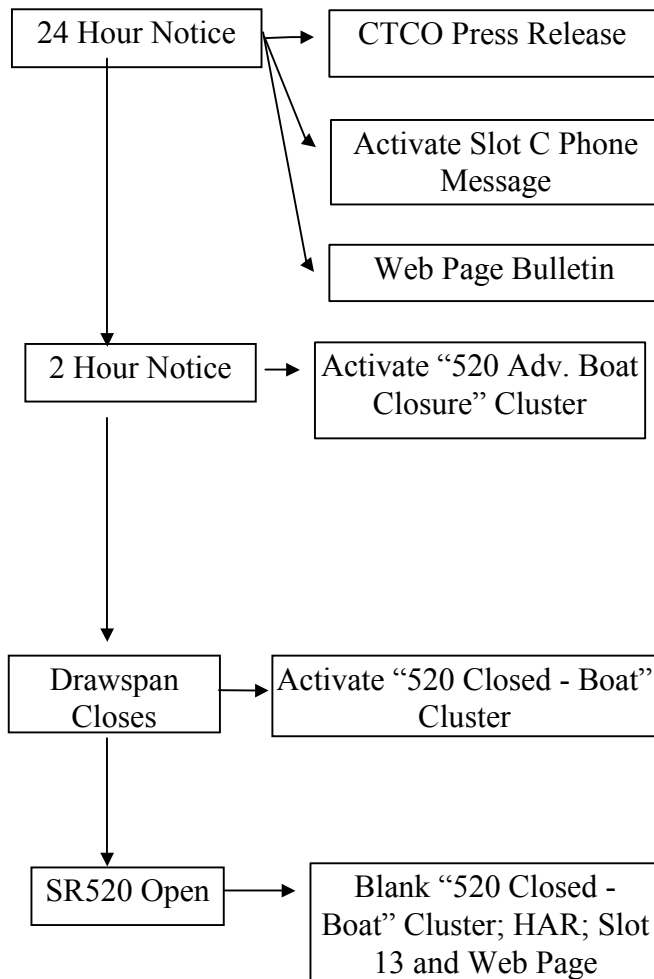
SE 8th St - SB	12.76	◇
SE 52nd St - SB	9.25	
NE 44th St - SB	7.43	◇
NE 30th St - SB	6.50	
NE Park Dr - SB	5.39	◇
SR 169 - SB (inactive)	3.95	◇
Interurban - SB	0.86	◇
SR 520 eastbound	Milepost	HOV
Montlake Blvd - EB	1.05	◇
Lake Washington Blvd - EB	1.55	
92nd NE - EB (inactive)	5.20	◇
108th Ave NE - EB (2 meters)	6.26	
148th Ave NE - EB	9.23	◇
NE 40th St - EB (2 meters)	10.29	◇
NE 51st St - EB	10.91	◇
SR 520 westbound	Milepost	HOV
W Lake Samm Pkwy - WB (2 meters)	11.66	◇
NE 51st St - WB	10.69	◇
NE 40th St - WB (2 meters)	9.99	◇
148th Ave NE - WB (2 meters)	9.20	◇
124th Ave NE - WB (2 meters)	7.50	◇
108th Ave NE - WB	6.25	◇
104th Ave NE - WB (2 meters)	5.95	◇
84th Ave NE - WB	4.62	◇

Appendix C – WSP Zones Map

The WSP CAD current incident inquiry page lists the geographic zone the incident is in. If there is any question of an incident's location from the text description, check which zone it is in (hit F5 from the "Active CAD Log Browse" screen). The following map depicts the State Patrol's geographic zones:

Appendix D – Flow Room Procedures for SR 520 Floating Bridge Closures

The United States Coast Guard’s regulations require that all marine traffic wanting to pass through the SR520 drawspan must give a minimum 2 hours notice before opening. The procedure outlined below will be used whenever the SR520 drawspan is schedule to open for marine traffic.



Slot 13 Phone Message

"The 520 Bridge will be closed on _____ between the hours of (actual time) and (actual time plus 30 min) to open the drawspan for boat traffic. Motorist are advised to plan accordingly."

Web Page Bulletin

"The 520 Bridge will be closed on _____ between the hours of _____ and _____ to open the drawspan for boat traffic. Motorist are advised to plan accordingly."

520 Adv Boat Closure Cluster

Each of the seven VMSs need to have the 'SR520 Advance' message modified to reflect the closure times.

*SR520 BRIDGE TO CLOSE
BETWEEN ____ AND ____*

VMS-097 I-5 NB @ S. HOLGATE
VMS-124 I-5 NB @ LAKEVIEW BLVD
VMS-130 I-5 SB @ SHIP CANAL BRIDGE
VMS-532 SR520 WB @ 124th AVE NE
VMS-658 I-405 NB @ SE 57th
VMS-694 I-405 NB @ NE 10th ST
VMS-708 I-405 SB @ NE 53rd

520 Closed - Boat Cluster

This cluster consists of the same seven VMSs as listed above.

*SR520 BRIDGE CLOSED
FOR BOAT TRAFFIC*